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INDIA RUBBER WORLD

Published at 420 Lexington Avenue, New York, N. Y.

Volume 93 **New York, February 1, 1936** **Number 5**

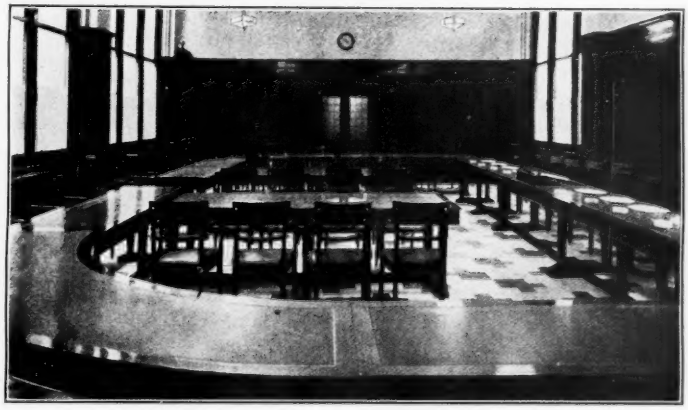
The Rubber Growers' Association

Purpose, Development, and Influence

THE importance of rubber in commerce and industry is revealed in the planned objectives of the various British rubber associations organized in the interest of the different divisions of the industry, ranging from rubber production to applications of its vulcanized products. These organizations are equipped to promote research in rubber science and technology and by mutually cooperative alliances distribute to members and more or less to the trade at large information to aid the progress of the industry by the improvement of rubber products and the development of new uses for rubber.

Prominent among these organizations is the Rubber Growers' Association, which is in close contact with producers and other interests of the East. The record of its origin and work[1] discloses the constructive guidance exerted by this organization for the development of the rubber industry both technically and commercially. The Rubber Growers' Association is the outgrowth of the thought of the late John McEwan, who called together a few associates on June 24, 1907, "to propose some means of working jointly for common ends in rubber growing." The group of thirty-three who attended that meeting rendered a valuable service to the rubber plantation industry by laying the foundation of what can be claimed to be the most powerful and representative organization connected with it. At the time of its inception the various sections of the Association dealt with matters concerning rubber production in Malaya, Ceylon, South India, Borneo, Java, and Sumatra, then in varying stages of development. In some cases production was hardly appreciable. At the present time the area under plantation rubber is estimated at over 8,000,000 acres. The production of

THIS article is one of a number, the purpose of which is to inform the rubber trade concerning the leading rubber associations whose policies, individual and collective, promote the best interests of the entire rubber industry by research and development in production, technology, commerce, and also the organized extension of new applications for rubber.



Council Chamber of the Rubber Growers' Association

[1] "The Rubber Growers' Association (Incorporated). Notes on Its Formation and Its Work for over a Quarter of a Century." Issued February, 1935, by R. G. A., 19 Fenchurch St., London, E.C.3, England.

plantation rubber in 1934 was nearly 1,000,000 tons.

From its modest beginning in 1907 the R. G. A. has grown during its existence of over a quarter century to a membership of 1,107, of which 486 are individuals and 621 companies. The latter represent an issued capital of £114,567,000 and control 1,906,000 acres planted or interplanted with rubber.

Organization

The operations of the Association are administered by a council consisting of the chairman, vice chairman, and sixty ordinary members. The council, one-third of which retires annually, is elected by the members of the Association. Membership of the Association and of the council is purely voluntary, and the Association has no power of compulsion over its members. One of the features of the present constitution is that of electing a new chairman and vice chairman each year. The roster of past chairmen of the Association is an impressive list of men of exceptional scientific attainments and administrative experience.

Committees

The council, as governing body of the Association, delegates a large amount of work to various committees, the members of which are qualified to deal with specific matters entrusted to them. These committees do all the detail work, submitting reports regularly to the council so that all matters brought before the Association receive exhaustive examination before they are finally passed upon. The committees are either on a territorial basis or deal with specific subjects. Temporary committees have been created from time to time for special purposes, but the standing committees are fifteen in number.

Work of the Association

The published record of the Association is contained in twenty-five annual reports, sixteen volumes of the monthly bulletin, and numerous brochures and pamphlets. It is not possible to convey an adequate idea in a summary of the work as a whole. Special mention should be made, however, to three main activities of the Association: namely, scientific research, propaganda, and commercial research. The first dates almost from the inception of the Association. The second arose to intensive action just after the termination of the World War. The third dates from May, 1930.

Scientific Research

In 1909 certain members of the Association established a research station in Malaya. The following year one was established in Ceylon, and funds were provided by means of guarantees from a comparatively small number of producers. In 1916 both research stations were taken over by the Rubber Growers' Association so that the benefits could be made available to all members. In 1921 the Association's research organization in Ceylon was merged in the Ceylon Rubber Research Scheme toward which the R. G. A. made an annual grant. The importance and value of the research work being carried out warranted the respective governments establishing by legislative enactments the Rubber Research Institute of Malaya in 1925 and the Ceylon Rubber Research Scheme in 1930, thus relieving the R. G. A. of its direct financial commitments on this work. The total expenditure under the auspices of the Association on production research until the establishment of the research organizations financed from a cess on rubber exports amounted approximately to £130,000.

It was not unnatural that a producers' association should confine itself to research on production, and the program undertaken in the Far East under the protection of the Rubber Growers' Association dealt in the main with the development of standard practice in the exploitation of the bark of Hevea, the preparation of the highest quality plantation grades, and the principle of plant sanitation and disease prevention.

Technical Research

About 1930 the F. M. S. government made available to the Rubber Growers' Association the sum of £100,000 for the development of research on the side of consumption, and the Technical Research and Development of New Uses Committee was formed in consequence. This committee endeavors to interpret its mission literally, avoids fundamental research, and seeks to penetrate new fields for increasing consumption of rubber. It has deputed its researches to universities, technical colleges, research institutes, and consultants. It patents its discoveries and hands their exploitation to the Rubber Producers' Research Association for the benefit of the industry. This separate corporation was formed in 1933, and most of the members of the Technical Research Committee sit on its council. Its guiding principles are to provide a convenient separate entity for furthering and consolidating that part of the technical research work initiated by the Rubber Growers' Association which involves applications for patent rights, the consideration of commercial arrangements, and the assumption of responsibilities in relation to them.

The Technical Research Committee is a very busy one in that its decisions involve considerable study and effective coordination. It has constantly in mind the necessity of developing a scheme of fundamental research commensurate with the importance of the industry. This is now taking shape and evolving toward practical proposals along international lines.

Development of New Uses

The search for new and extended uses of rubber has always been a prominent feature of the Association's work. In 1919 funds were collected from producers, and a prize competition organized for the best suggestions for new uses for rubber. In 1921 the Association formed a separate Propaganda Committee and obtained substantial contributions from producers, governments, and others for propaganda activities. The dominating objectives of the committee's policy were the extension of existing uses of rubber and the development of new uses. The problem at the outset was to develop activities through the logical sequence of producer, manufacturer, distributer, and consumer.

The fourteen years' work of the Propaganda Committee has been supported by an energetic and expert committee consisting of members of the council and representatives of the India Rubber Manufacturers' Association and the Institution of the Rubber Industry. Between 1921 and 1934 the expenditure on the Association's propaganda activities amounted to £284,000.

Typical activities of the committee include advertising and publicity for the crepe rubber sole as a standard material exclusively used in the footwear industry; cooperation with manufacturers in publicity for rubber flooring; participation in ninety-one exhibitions; special propaganda work in Australasia, Belgium, and France; the preparation of twenty-one technical handbooks involving the issue of 1,267,000 copies; twenty-four miscellaneous publications, the issue of which comprised 61,000 copies; and thirty-seven handbooks in fourteen foreign languages, comprising 277,000 copies. The committee

retains the services of consulting chemists and a consulting mechanical engineer, who are available for technical advice. In addition the Propaganda Committee has established close relations with producers, planters, and manufacturers' associations throughout the world.

Commercial Research

The Commercial Research Committee, appointed in May, 1930, follows up the previous endeavors of the Statistical Committee. As a result, arrangements were made with governments of producing territories and various organizations in consuming countries to supply regular and prompt information. The statistical services supplied in the *Bulletin* and otherwise are indications of the great development of this work. In connection with the Rubber Regulation Scheme the Association has agreed to assist in the collection of rubber production costs, which information is very necessary to guide the International Rubber Regulation Committee in one of its most important functions.

This truly impressive organization stresses cooperation as the keynote of its policy. This spirit has had a beneficial influence not only within the ranks of the Association's membership but in creating an atmosphere of friendliness and confidence throughout the various organizations which serve other interests in the vast rubber industry. The Association is in close contact with producers and other interests in the East either through its local committees or separate local organizations. Thus a close coordination exists between London and the East on all matters affecting the plantation industry. Similarly cooperation and contact are maintained with the producing interests of Netherland India, Java, Sumatra, and French Indo-China. The Rubber Growers' Association also cooperates with the Ceylon Association in London, the South Indian Association in London, the Rubber Trade Association of London, the manufacturers' associations in Great Britain, Europe, and the United States of America, also with various research organizations at home and abroad.

This record is one to inspire great respect for the admirable organization and accomplishments of the Rubber Growers' Association and confidence in its continuing ability to safeguard the production of natural rubber for the benefit of the industry. In other words: "The marines have landed and have the situation well in hand."

Para-Graphs

CHLORINATED RUBBER. An example from a patented method of forming chlorinated rubber follows: A solution of masticated pale crepe or smoked sheets in tetrachloromethane of 5 to 10% rubber content is prepared. To this solution 300 to 400 parts of an alkali metal bicarbonate, such as sodium or potassium bicarbonate are added on each 100 parts of rubber contained in the solution. A current of chlorine is then bubbled through the solution at a temperature of 10 to 15° C., while stirring, until a chlorinated rubber of 40 to 70% chlorine content has formed. Then, the reaction mixture is heated for two to three hours at its boiling point. After cooling, the reaction mixture is filtered, and the filtrate evaporated, or the chlorinated rubber having formed is precipitated by means of methyl- or ethyl-alcohol. The reaction product is thus obtained in a stable and nearly colorless form. It is easily soluble in benzene toluene, xylene, etc., and is completely stable in the solid state as well as in solution at normal temperature.

OXYGEN TENT. A new method in England of administering oxygen in medical cases utilizes an apparatus consisting of a rubber "tent" with celluloid windows. The apparatus, known as an oxygen tent, is fitted over the head and shoulders of the patient. It is said the results are so satisfactory that the possibilities of establishing a new National Oxygen Tent Service are being discussed so that the method can be available in hospitals throughout the country.

RUBBER SAFETY EQUIPMENT. Soviet Airmen recently demonstrated the capabilities of rubber safety equipment when flying over open stretches of water. A deflated rubber boat attached to a parachute was first thrown from the airplane, after which three airmen jumped with parachutes from a height of 2,500 feet, each man inflating a rubber lifebelt in his descent. Just before striking the water, the parachutes were discarded. The rubber boat was inflated by the man landing nearest to it; then he rowed around to pick up his companions.

FIBER-RUBBER PRODUCT. A fiber-rubber product is made with the fiber oriented to provide fiber-reenforced rubber articles possessing greater flexibility in one direction, as for example soling for shoes. Following is the method. Long cotton fibers dyed brown are formed into a thin bat on a garnetting machine. Twenty-five parts of the garnetted material are then slowly fed into a rubber composition on a mill which has been prepared from the following materials in accordance with usual rubber compounding practice:

	Parts
Rubber (smoked sheet)	100
Sulphur	3
Zinc oxide	5
Diphenyl guanidine	¾
Clay	10
Red oxide	5
Carbon black	1

The fibrous material is presented to the rubber composition on an uneven speed mill in such a manner that the direction of the fibers is substantially normal to the axes of the rolls of the mill. As soon as the fibers have been thoroughly worked into the mass, the compound is formed into sheets of any desired thickness by passing it between calender rolls. It is desirable, but not necessary, to calender the material in the same direction that it has been milled. Then the grain of the rubber and the parallel disposition of the fibers which has largely persisted through the milling operation remain practically undisturbed. The calendered material may be vulcanized in known manner in sheet form, such as when the finished article is to be employed as a floor covering material, or suitable shapes may be died from the calendered sheets and the died pieces cured in a mold as in the manufacture of shoe soles. In the latter case the pieces should be died out in such manner that the parallelly disposed fibers of the rubber composition extend lengthwise of the sole. In this manner a sole is obtained which possesses improved longitudinal flexibility and desirable transverse stiffness.

Annals of Rubber[1]

Chronological Record of the Important Events in the History of Rubber

1928. Stevenson Scheme was discontinued November 1, marking abandonment of restrictions on exportation of crude rubber from British controlled territory in the Far East.

The B. F. Goodrich Co., Akron, O., introduced weftless cord fabric in the manufacture of balloon tires.

1929. Dr. George S. Whitby, of McGill University, Montreal, P. Q., Canada, was awarded the first Colwyn gold medal, "in view of his work on numerous important problems connected with the subject of rubber."

The General Rubber Co., New York, N. Y., had 63,000 acres in Sumatra and 30,000 acres in Malaya under cultivation for rubber.

Accelerators to facilitate low temperature vulcanization with high tensile properties were introduced.

On May 10, 1929, The Rubber Association of America, Inc., changed its name to The Rubber Manufacturers' Association, Inc.

The United States Rubber Co., New York, N. Y., concentrated its tire building at Detroit, Mich.

Japan had 531 factories for making rubber goods.

W. B. Pratt was granted United States patent No. 1,732,027, covering a method of dispersion of crude and reclaimed rubber.

La Goma, the organ for the Spanish rubber and allied trades including gutta percha, asbestos, ebonite, celluloid, and other plastic materials, their derivatives, and applications, was established at Barcelona.

Thomas A. Edison was granted United States patent No. 1,740,079 (December 17) for a method of rubber extraction from goldenrod.

1930. The Ceylon Rubber Research Scheme established by Government enactment, Ceylon Ordinance No. 10 of 1930, was financed by a cess on rubber exports.

1931. Father Julius A. Nieuwland, professor of organic chemistry, University of Notre Dame, South Bend, Ind., W. H. Carothers, and other research chemists of E. I. du Pont de Nemours & Co., Inc., Wilmington, Del., developed synthetic beta-chlorbutadiene, the synthetic rubber called "DuPrene"[2] (U. S. patent No. 1,829,502, October 27, 1931). This outstanding accomplishment differs from natural rubber and, when vulcanized, is superior to it in resistance to sunlight, flexing quality, swelling, and deterioration by oils.

1932. Marked interest and activity occurred in the application of latex in industry.

Thiokol, a synthetic chemical product possessing some of the physical properties of rubber, rapidly gains industrial recognition as a rubber-like product compounding material for the protection of rubber against the destructive effect of oils and rubber solvents.

Japanese made rubber soled tennis shoes retailed in New York, N. Y., at record low prices. The style and workmanship of these goods compare reasonably well with similar goods of domestic make.

1933. George Oenslager, chief research chemist, The B. F. Goodrich Co., Akron, O., was awarded the Perkin Medal of the Society of Chemical Industry at a meeting of chemists held in New York, N. Y., January 6. This award was made for his discoveries of organic accelerators of vulcanization.

The Commodity Exchange, Inc., of New York, became operative May 1, representing a merger of the Rubber Exchange of New York, the National Metal Exchange, the National Raw Silk Exchange, and the New York Hide and Metal Exchange.

Schidrowitz and Unger, of London, were granted British patent No. 368,902 for a process of producing softened rubber from ordinary plantation and sheet, with the object of facilitating mechanical processing of the rubber.

Rubber Producers' Research Association, London, England, was incorporated in August for "furthering and consolidating that part of the technical research work initiated by the Rubber Growers' Association which involves application for patent rights, the consideration of commercial arrangements and the assumption of responsibilities in relation to them."

1934. The International Rubber Regulation Committee organized ". . . to regulate the production and export of rubber in and from producing countries with the object of reducing existing world stocks to a normal figure and adjusting in an orderly manner supply to demand and maintaining a fair and equitable price level which will be reasonably remunerative to efficient producers."

Low pressure balloon tires in 15- and 16-inch diameters were introduced, using 20 to 28 pounds' inflation pressure.

The Rhode Island Rubber Club was organized April 27 at a dinner at the Hotel Warren, Warren, R. I. It is a purely independent organization of "rubber-conscious" men of Rhode Island, with no affiliations.

Thomas Midgley, inventor of demountable rims and holder of more than 300 patents for the manufacture of automobile tires and rims, died December 25, 1934.

1935. On June 7 the newly completed Goodyear factory at Buitenzorg was opened by Paul Litchfield, president of the Goodyear Tire & Rubber Co., Akron, O., in the presence of a number of prominent persons. The first Goodyear tire carcass and the first inner tube produced at the Buitenzorg factory were presented to the Commercial Museum at Batavia to be on permanent exhibition.

Norman A. Shepard, director of chemical research of the Firestone Tire & Rubber Co., Akron, O., was elected chairman of the Rubber Division of the American Chemical Society.

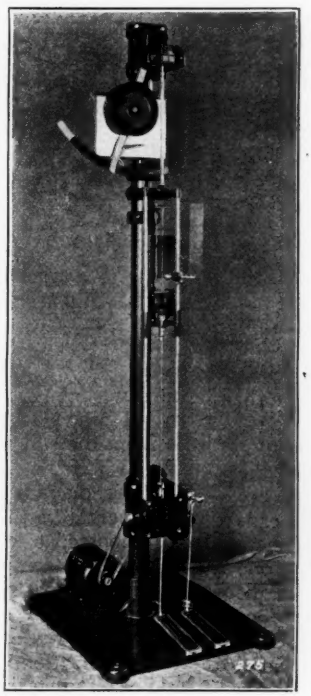
Wm. M. Morse became Editor Emeritus of INDIA RUBBER WORLD on July 8 after twenty years' active participation in the editorial department of that publication. His successor, D. C. McRoberts, assumed the post of editor of the paper. The latter's connection with the rubber industry covers a period of twenty-two years continuous activity in both the technical and manufacturing phases of various branches of the rubber business.

[1] Concluded from INDIA RUBBER WORLD, Jan. 1, 1936, p. 38.
[2] Trade mark registered.

Material Selection— A Footwear Problem

David Phillips

THE average buyer of rubber foot covering has little conception of the thought and care with which its materials have been selected. Fortunately for the purchaser, however, manufacturers are becoming more and more materials minded and realize the need of turning out a well-balanced article of footwear. The components must possess many different and exacting characteristics if the final product is to meet with public approval. A dependable watertight shoe covering which can hold its shape and appearance of newness after long use and still sell at a sufficiently low price to insure large volume to the producer is a real problem, particularly at a time when price cutting again looms on the industrial horizon.



Scott Rubber Tester Used in Shoe Stock Formulae Development and Quality Control

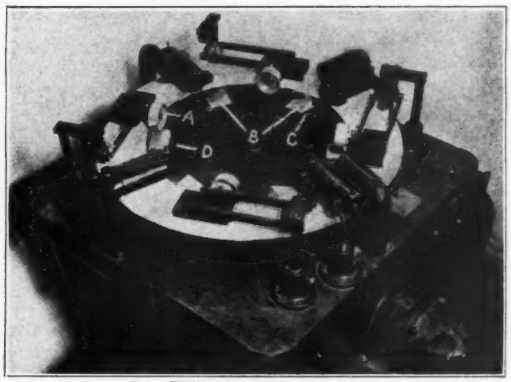
Reputable manufacturers make painstaking analysis to select the proper gum compounds, fabrics, binders, and accessory fittings to be incorporated in each style of rubber shoe, to meet the exacting test of public service within its particular price range. The manufacturers also conduct control tests of representative finished products in order to make doubly certain that the quality runs uniformly true to its particular style specification.

Otherwise the buyer is not protected and frequently may be unpleasantly surprised to find that his rubbers or other gum products have become useless after limited wear. Perhaps the surface cracked after bending back and forth a few times or became sticky because of faulty vulcanization. Fabrics sometimes fail to hold their color or may pull away from the gum coating. These faults and innumerable others which conscientious manufacturers try to avoid annoy the consumer and demand that constant research be carried on if the variables of mass production are to be met successfully.

If the shoe has been purchased at a cut-rate figure, such an early end to wearing qualities might not be unexpected. Should, however, a reasonable price be paid, sufficient to reward the manufacturer for his patient research, a fair return in footwear mileage is justly due the buyer.

Foundation of Shoe Vital

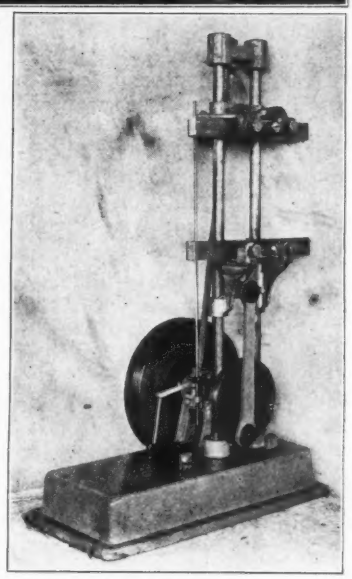
Linings and innersoling comprise the foundation of practically every type of shoe and are accordingly selected with due consideration for the service intended. Lining materials above all must have the ability to stretch when being pulled over a shoe making form. At the same time they must be inherently strong enough to resist rupturing. Linings should also have the faculty of quickly returning to a predetermined pattern after being extended over the last and should remain in closely fitted contact with the surface of the making form at all times during the process. A closely meshed surface is another important feature of lining materials as one side is generally required to support a gum calendered coating without breaking through to the other side.



Henry L. Scott Co.

New Jersey Zinc Co. Type of Abrasion Machine — One of the Various Kinds Utilized to Determine the Wear Resistance Quality of Sole and Heel Stocks

Materials such as nets, fleeces, and jerseys are frequently used owing to their ability to meet the above specifications. Their weight is also a matter of considerable interest and is generally in direct proportion to the severity of the duty expected. Light, dainty footwear for feminine wear on



National Rubber Machinery Co.

National Model D Flexing Machine Determines the Ability of a Rubber Stock to Bend Repeatedly without Cracking

city streets, for example, is often made over medium height lasts and demands a very light net. Heavy-duty, masculine footwear for suburban or general utility use requires a much heavier grade of lining for its foundation.

Warmth an Important Factor in Lining Selection

Warmth is another factor which must not be overlooked in selecting such materials, and frequently a heavy weight, long fibrous, fleecy material fills the bill, particularly for heavy-duty foot covering intended for wear in sub-zero temperatures. The conventional "arctic," or overshoe, as well as gum boot linings are often made from such fleecy, extensible materials. After calender-coating, they are die or hand cut to various high and low patterns as the style may be. The next step is edge cementing and then "joining" into a suitable piece to enclose completely the last upon which it lies as a foundation piece for subsequent shoe parts.

Considerable sales appeal comes from attractive lining materials, and if color and texture suggest warmth with snug fitting and light weight, time spent in their selection is well repaid.

Innersoles—the Inner Tread

Innersoling, as the name implies, is, as a rule, laid next to the last and held in place by the extensible cement-coated edges of the coated linings. An innersole coming next to the foot should have among its desirable properties the ability to throw off or absorb perspiration odors. It should not crack easily and should be able adhesively to retain rubber cement on its surface in sufficient quantities to anchor securely the lining edges and filling materials, before and during vulcanization.

Thinning out or spreading under the weight of the wearer is an undesirable property, and materials are seldom used in the better grades of footwear which cannot withstand this tendency to "creep" as such innersoling distorts and weakens the entire shoe. When one realizes that in walking or running the entire weight of the wearer is often thrown on to the ball of the foot and that it is thus concentrated on an area not greater than a few square inches, it is easily visualized that a flattening effect or pressure of some 50 pounds per unit area can be exerted on to the shoe bottom at this point.

Adding the softening effect of warmth from the foot and the extreme pressures caused by athletic use such as jumping, it is little wonder innersoling materials require careful thought in their selection if they are to withstand such heavy abuse.

The composition of this kind of inside soling materials varies greatly. Often a deodorized, highly specialized compound made from paper, leatherettes, fiber, or just plain rag is used. Rag is more or less the dumping ground among the field of rubber compounds and, when sheeted out for innersoling, is frequently garnished with a layer of coated sheeting on the side which is to come in intimate contact with the foot. Heavy rag innersoling is used in men's footwear; whereas the deodorized and novelty materials have greater sales appeal for the feminine and juvenile trade.

Every Shoe Needs a Backbone

To give rigidity, together with flexibility, it is necessary to add suitable reenforcing pieces at several points in a shoe. These parts are cut to various shapes so as to build up and support the shoe structure. Rag again comes into its own for just such purposes owing to its comparative stiffness and deadened elasticity. Some manufacturers use it at the heel portion of the shoe, tapering the ends away at the middle, or shank, portion.

These stiffeners, properly cemented on both sides, also act as a binder upon which to lay the final covering of waterproof material. This latter part is almost always a straight gum compound, and often a piece of frictioned fabric is used between it and the rag. Toe ends usually need stiffening lest the completed shoe present a collapsed appearance and wear prematurely. This reenforcement is accomplished by adding gum coated or "frictioned" strips on to the lining as it clings to the shoe form, thus making the familiar box toe cap effect which is not quite so pronounced as in leather footwear construction.

Great Variety in Shoe Uppers

The top part of a shoe, customarily called an "upper," differs greatly with each variety of footwear. Athletic shoes of the fabric type, for example, generally use heavy reenforced duck and have leatherette or similar trimming to stiffen up the lacing stays. Saddle straps and ankle interference patches are also supplied from leather-like, waterproofed materials and are sewed to the uppers before these parts are lasted.

Arctics and gaiters often have fabric tops for warmth. Fancy embossed rubber uppers for this style of shoe, which assure the buyer of complete waterproof protection, are also available. Rubber boots have all-rubber uppers with heavy reenforced linings. In appearance they are frequently of plain design as this type of footwear is bought primarily for its practical usefulness. Suburban communities, construction camps, fire protection, and mine work provide a sales outlet which demands little from the stylist, but a great deal from the technical angle.

Rubbers, or gum shoes as they are known to the trade, are "uppered" with gum compounded materials sheeted from embossed calender rolls and then cut into tops of the desired pattern and size. The gum upper is next laid on to a gum coated lining, previously placed about the shoe form, making certain the entrapped air is expelled in order to provide a smooth, closely adhered surface after vulcanization. Uppers, like many other components of rubber footwear, are specifically designed to fill the need in their particular field. Years of experience have taught the producer much in this respect, and today he can design new shoes for the market with a confidence acquired through many seasons of practical experience in meeting public demand.

Outside Binding Frequently Ornamental

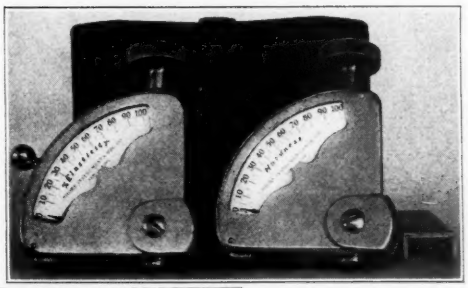
Light weight gum footwear seldom has any pronounced exterior bindings along the lower portion, but heavier grades need considerable reenforcement along these lower sides, particularly where the outer soling and uppers join. Binding the outersole to the top portion or "upper" of a rubber shoe presents more of a problem than similar joints in leather construction.

This binding, or trimming, is frequently called "foxing" or "piping" and is analogous in many respects to the welt in leather shoes. It is generally made from gum compound, occasionally fabric reenforced, and is adhesively applied between the upper and outersole edge at the lower part of the shoe. Exceptionally heavy-duty footwear is sometimes made with an additional outside binding strip which completely covers the edge of the outersole entirely around the shoe and binds it more securely to the upper.

Shoe trimming is frequently made in neat geometric designs with colors contrasting to the upper or outersoling, and besides giving individual appearance to the

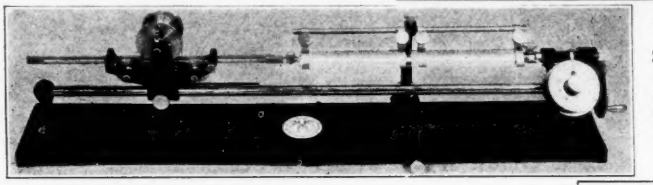
manufacturer's brand, such treatment lends a dressier effect and provides sales appeal.

Finishing off strips of comparatively narrow widths and also of embossed design are placed around the top edge of the shoe upper, giving a final decorative note while at the same time being of real practical value in reenforcing the edge against tearing whenever the shoe is being stretched over walking shoes. These narrow binding strips are almost always of gum compound and adhere with slight rolling pressure by their own tackiness to the neck of the upper as they are drawn around the shoe form.



Shore Instrument & Mfg. Co.

Shore Durometers Permit of Quickly Checking the Correctness of Cure by Measuring the Hardness of Shoe Stocks



Henry L. Scott Co.

Twist Tester Used to Analyze the Uniformity of Fabric Thread Constructions

Outersoles Need Non-Skid Tread

Outersoles for gum footwear are almost too varied in design and composition for classification. Just as the tread of a tire contacts the road bed and bears the brunt of the wear, so must the outersole of a shoe withstand terrific abuse. Resistance to impacts, cuts, maintenance of non-skid properties, and big mileage are every bit as important in rubber shoe soling as in tires.

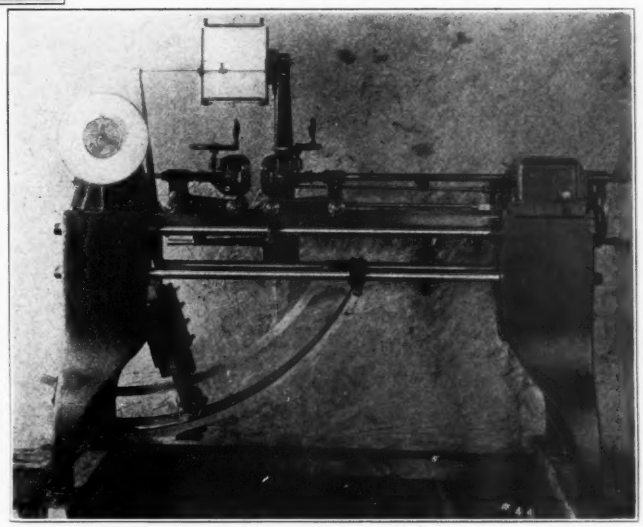
Attractiveness in design and continued adhesion to the shoe proper over long life are some of the points carefully considered in outersole selection. In general outersoling is of two groups: molded and calendered, and they are accordingly divided into these two classes because of the methods by which they are prepared in the process.

Molded outersoles, as the name implies, are made in heated molds filled with plastic gum compound and then held tightly closed under great pressure by hydraulic rams until cured to the desired hardness. The pattern design and size which it takes is determined exactly as with tire treads: namely, by the accuracy of the impressions and outlines engraved on the tread side of the mold. Heated platens cure the compounded gum while the press ram compacts it within the molds.

Calendered outersoles are made by sheeting out compounded material in continuous lengths. After being stamped or embossed as it passes through the engraved rolls of the calender, the sheeting is customarily conveyed on belts and cut to lengths suitable for handling. The soles are next cut from the sheet by hand or machine into the required sizes. Calendered outersoles themselves are divided into two classifications: the plain, or flush edged sole, and the rolled, or extended type which wraps up around the lower part of the shoe and gives the heavy, rugged appearance so common on rubber boots, suburban-type rubbers, and heavy arctics.

An outersole is judged for wear primarily by the mileage it can deliver and is therefore carefully compounded and vulcanized with this point in mind. Rarely is it made from other than gum compounds containing suitable toughening ingredients. Composition-type soles are on the market, some of which are compounded and molded from patented combinations such as felt or cork as a filling material. Latex and gum compounds are frequently used as a binding agent.

The surface design is intended to please the eye and, what is considerably more important, to prevent skidding and thus be of real practical value. Even after the tread has worn smooth and thin, it is a distinct advantage to have a material which can maintain an abrasive grip on the pavement or field of sport.



Scott Horizontal Tester Used in the Selection and Control of Fabrics for Use in Rubber Footwear

Shoe Trimming—Ornamental as Well as Practical

The matter of accessory equipment for gum footwear products today is given more thought than in former years. This is due to the increased demand for stylish, yet practical foot covering. An interesting example of the trend in shoe design may be had from the history of the so-called overshoe. For many years the industry coasted along perfectly contented to make and sell the same conventional black arctic which our grandparents wore. It was equipped with several of the familiar black, slotted style of buckle fasteners which have a snap tongue to engage the slot selected to give the desired fit about the ankles.

Suddenly the zipper type of sliding fastener, fancy snaps, elastic gussets, and many other closure devices came on the market, and the transformation of the bulky arctic into the light weight, carefully tailored and styled gaiter of today was begun. Artistic, yet practical accessory fittings are a decided asset to any shoe, and they have made possible in large measure the acceptance by the feminine buyer of light weight footwear now in vogue. The heavier appearing, more practical closure devices such as the hook and slotted type seem destined

(*Continued on page* 41)

Bare Rubber Knitted[1]

But Concealed from View in Interesting Fabric Recently Patented

BARE rubber is cheaper than covered rubber—by a very appreciable amount; but how to use it in plain or jersey-stitch knit goods without the presence of the rubber being evident to the eye has in the past proved too much of a problem for the knitting industry. Now "Velv-o-flex," a patented fabric (U. S. Patent 2,009,361), accomplishes the results sought by an adaptation of the plating principle to the manufacture of elastic fabric. However, although the principle may be the same, the effect is entirely different, as the rubber appears on neither the face nor the back of the fabric. The average knitter will declare that it is quite impossible to plate one yarn on another without the latter showing on the back; but Velv-o-flex proves not only that it is possible but also that it is relatively simple—when rubber is the material to be covered.

The invention and development of the new fabric are the most recent contributions to the art of knitting made by John Lawson, president and treasurer of the Lawson Knitting Co., Pawtucket, R. I. Mr. Lawson is well known to the industry both by the place he has earned for himself as a successful builder of knitting machines and as an inventor of many knitting mechanisms.

At each feed of the machine knitting Velv-o-flex a rubber thread is run in simultaneously with a textile thread of silk, cotton, or other fiber. The rubber thread would contract more than the textile thread even if the two were fed at the same tension, but actually a greater tension is applied to the rubber to accentuate this contraction. Obviously, the machine must be equipped with compensators or furnishing wheels and a special tension for the rubber.

The first effect of the contraction is to pull the needle and sinker loops of the rubber to a position in which they will occupy the least space, and this is naturally on the inside of the fabric. Thus in Figure 1, which shows theoretically this intermediate stage of the contraction, the rubber yarn, drawn plain white, nestles inside of the textile yarn, drawn with twist spirals. The result is that the textile thread is plated over the rubber thread in the needle wales on the face of the fabric and over the rubber in the sinker wales on the back of the fabric. Thus the textile thread crosses over from the face to the back of the fabric and vice versa, as is shown clearly in the edge or sectional view at Figure 2, which was taken along the vertical broken line at Figure 1. In other words, the more bulky, non-elastic textile yarn is forced to the outside of the fabric on both the face and back.

Actually, however, the contraction has barely begun at this point. The rubber loops contract to a smaller size than the textile loops, as shown in Figure 3; and they pull in the fabric both lengthwise and widthwise, thus crowding the textile loops together and closing them to present a solid surface. As a result, the rubber completely disappears from view and is not clearly evident even when the fabric is subjected to extreme stretching—partly due, no doubt, to the fact that such stretching very materially reduces the diameter of the rubber thread. In fact, Mr. Lawson asserts that the rubber is more effectively concealed than is the core of a covered yarn knit in the usual manner.

Furthermore, the contraction of the rubber forces the textile loops to stand out from the body of the fabric to form a pile, thus affording an unusually soft surface on both face and back. The fact that in what is expected to be the most common construction of Velv-o-flex fabric there are two and one-half times as much textile yarn as rubber yarn is assurance that the cloth will retain the most important characteristics of a textile material. The fabric is adaptable to napping on both sides, since the rubber, lying in the center of the cloth structure, is completely out of reach of the napper wire.

Fabrics which can be knitted on this principle range from hosiery to girdles, and the invention is fully applicable to rib fabric, as illustrated in Figures 4 and 5. Since cloth so produced is not only economical to manufacture but also possesses remarkable softness and high elasticity, it should find a place for itself among textile fabrics and possibly in new fields.

[1] Reprinted from *Textile World*, Dec., 1935, p. 87.

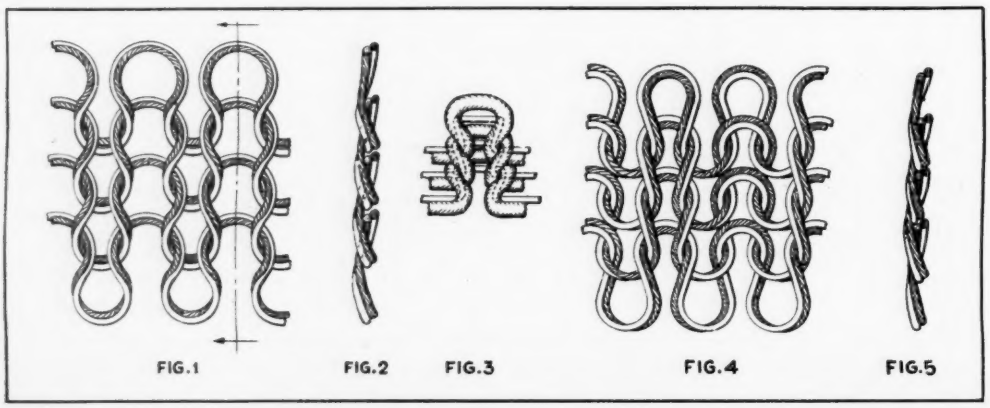


Fig. 1. Bare Rubber Knitted with a Textile Yarn
Fig. 2. Edge View of Fig. 1
Fig. 3. Further Stage of Rubber Contraction
Fig. 4. A Rib Fabric
Fig. 5. Edge View of Fig. 4

Rubber Production[1]

Edgar Rhodes[2]

ON THE whole then, in so far as estate smoked sheet rubber is concerned, Malaya is turning out an increasing amount of rubber which is more carefully prepared than it was a few years ago and which should prove more acceptable to users generally on Sackett's criteria.[3] If users were able to contact directly with selected estates, the benefit of the improved manufacture should be felt at once; but in the absence of direct contact and assuming that brokers' consignments are usually mixed, with the result that each may contain rubber partly from reorganized estates and partly from estates which for some reason have not reorganized, users may not feel the effect of the present movement for some time.

The production of estate crepe has not changed appreciably in recent years except that fewer estates are making it.

The manner of production of native sheet from larger holdings in Malaya is improving, and on many of them the product is quite as good as the average estate product of ten years ago. These rubbers are not to be expected to be quite clean and free from sand and dirt. That will come in a few years.

The rubber from very small holdings is no better prepared than it was six years ago. It contains, as it always did, dead spiders, leaves, sand, dirt, and betel nut juice, and is manufactured in haphazard fashion. Most of it is bought in the form of Singapore blanket which finds a ready sale in the United States. The institute's smallholders' advisory service is trying to improve the rough and ready technique of these small producers by persuading them to clean their latex more thoroughly and by taking greater care in coagulation. They are being encouraged to dry and smoke their own rubber properly. In spite of these efforts not much improvement in native sheets or in Singapore blanket can be expected for some time to come. It is one thing to show a Malay holder what to do and another thing to get him to do it when you are not there.

A great deal of the rubber of which Singapore blanket is composed comes over for manufacture from the Netherlands Indies which is outside the institute's sphere of activity and influence; most of it is far worse than the Malayan counterpart, at least in appearance. All is grist that comes to the Singapore mills, and, even when the cleanliness of rubber has been improved in Malaya, its admixture with worse rubber from over the water may discount the institute's efforts to some extent.

Special Rubbers

If users required extremely soft rubber or rubber of extremely low water absorption, direct contact between user and producer would be an absolute necessity. In so far as rubber of low water absorption is concerned, it has already been indicated that, if we are to make a sheet which will pass in the present markets, no modification in technique will reduce its water absorption to a low enough value. If by special methods we do reach the correct value, the rubber itself will not then have an appearance which would make it acceptable as a market grade. Such rubber would need therefore to be made directly for the user. A similar state of affairs would arise in the case of extremely soft rubber. A user who wanted an extremely soft rubber and who paid a premium for it, would probably also want the producer to guarantee a fixed plasticity-tolerance limit. Estates in Malaya could not do this at present owing to the absence of executives with technical training.

AIR-DRIED SHEET. Sackett indicates a possible outlet for sheet rubber dried in hot air. Such material is being produced in Malaya, and fair amounts could be made available to users on demand. If rubber-sulphur bomb aging tests are any criterion, however, they would indicate the possibility of slightly poorer aging properties in hot-air-dried as against smoked sheet. In the institute's experiments with smoked and air-dried sheet from the same latex, such results have been obtained regularly.

Rubber Powders

Rubber powders are not yet in commercial production in Malaya although a plant is at work in Ceylon. Their cost of production must certainly be greater than that of sheet, and a premium in price will be necessary if their production is to be worth while in the East. Dusting will, as Sackett suggests, need to be carefully controlled and reduced in amount to the minimum compatible with safe transit. Further, the user should be prepared to find variations in properties just as they are found in latex and sheet rubber.

Vulcanization and Testing of Rubber

Sackett makes a number of useful suggestions for methods of testing. In Malaya so far only simple 100–10 rubber-sulphur mixes have been tested. The technical officers of the institute's London Advisory Committee carry out tests in accelerator mixes. The policy has been for the London colleagues to test in all types of mixes those samples which have seemed abnormal. The writer cannot say off-hand, however, whether or not the mixes employed in London are identical with those now suggested. It would be an excellent thing if American chemists, the Rubber Research Institute, its London Advisory Committee, and probably the English manufacturers could adopt standard mixes and standard testing technique. The sooner unanimity is reached, the better. The institute and its London colleagues will be only too pleased to discuss proposals for unification of testing. At the same time it might be possible to agree on some standard methods of deciding the presence or absence of mold and sand.

Conclusion

The institute welcomes contact with users in America.

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[1] Concluded from INDIA RUBBER WORLD, Jan. 1, 1936, pp. 41-44. Paper presented before the Division of Rubber Chemistry at the eighty-ninth meeting of the A. C. S., New York, N. Y., Apr. 22-26, 1935. Reprinted from *Ind. Eng. Chem.*, Oct. 1, 1935, pp.1204-209.

[2] Rubber Research Institute of Malaya, Kuala Lumpur, F. M. S.

[3] INDIA RUBBER WORLD, Dec. 1, 1935, pp. 31-34.

There have been a few occasions when users have approached the institute direct on matters in which it could be of obvious assistance. A notable recent case was that of the manganese deterioration brought by Sackett's organization. In this case the institute was able to be of some assistance and was itself benefited. Such cooperation is excellent and will be very welcome in Malaya.

It would be well also to establish some single committee or organization as a channel through which samples, reports, complaints, and suggestions could be circulated freely to American users from Malaya and the London organization and received in both places from America. If there were a constant contact, for example, between a technical subcommittee of the American Chemical Society's Rubber Division, the technical subcommittee of the London Advisory Committee, and the Board of the Rubber Research Institute, users' requirements would always be known, views could be exchanged, suggestions could be made, word battles fought, and samples and batches of new materials passed forward from Malaya and London for American works test.

Comments

The practice in rubber factories is to control carefully by specifications the quality of carbon black, zinc oxide, oils, etc., that are used in various compounds. Shipments that do not meet specifications are rejected because they have some undesirable effect on the rate of cure, modulus, tensile, hardness, etc.

When it comes to the purchase and approval of crude rubber, however, our attitude is most inconsistent. The practice is to buy crude rubber by grade according to color and cleanliness. No attention is paid to the variation in rate of cure, in modulus, in effect on processing, etc., of the one material which is used in greater volume than all of the others combined.

Differences of several hundred per cent in modulus at 700% elongation have been shown in a standard mercaptobenzothiazole test recipe using No. 1 ribbed smoked sheets from English estates. By using selected rubbers that show a very slow cure on the one hand and extremely fast cure on the other, in third-section tires with the standard curing rubber, undercure, optimum, and overcure sections have been obcould be obtained in the rst place.

The rubber technologist has been forced to develop accelerators, age resisters, and eveners, and to resort to selection and blending of rubber in order to produce a uniform product. All this has meant added cost, and in all probability quality is not all that it would be if a uniform-curing rubber could be obtained in the first place.

In addition, the rubber technologist must struggle with extreme variations in workability or plasticity of the rubber as well as variable amounts of foreign material.

It is entirely possible that the producers of crude rubber do not quite appreciate the difficulties encountered in the consumers' factories. On the other hand, the consumer may be expecting more than it is possible for the plantations to produce. It is evident, therefore, that some effort should be made to acquaint both the producer and the consumer with the other's difficulties and limitations.

HAROLD GRAY

B. F. Goodrich Co.
Akron, O.

The able presentation of these two papers requires no comment; however there are points brought out that should be further emphasized. Considerable stress was laid on rate of curing and aging of crude rubbers, and the two points are important; however, thanks to the able research work and results obtained by the research men on modern accelerators and antioxidants, these two points are somewhat relegated to the background.

Every modern rubber factory today is undoubtedly blending various shipments of crude rubber which further equalize the curing rates of various shipments of rubber. This blending makes a still more uniform rubber.

Crude rubber as a whole is quite free from deleterious materials which affect either the cure or aging properties. However the writer has seen quite large shipments of smoked sheet that were soft and mushy, and upon analysis found to contain manganese in appreciable quantities. Naturally, such deleterious materials cannot be tolerated. The two most important points were not stressed sufficiently:

CLEANLINESS. This means freedom from sand, bark, dirt, etc., contained in every type of crude rubber, particularly off-grades. Too much emphasis cannot be placed on the point that crude rubber should be freed on the plantations from these injurious and unwanted materials.

PLASTICITY OF CRUDE RUBBER. Very little has been done either by the producers or the consumers to obtain crude rubber of uniform plasticity. This point is of utmost importance, and methods, procedures, and equipment should be worked on by the committee suggested by Rhodes in preference to obtaining a formula or methods for uniform rate of cure and aging properties.

Every consumer of crude rubber is hampered appreciably by dirty rubber and non-uniform-plasticity rubber, and every effort should be made to correct these deficiencies.

WILLIAM G. NELSON

United States Rubber Products Co., Inc.
Detroit, Mich.

Colored Luster Surface Finish

COLORED luster finish is imparted to the surface of a rubber article by applying finely powdered aluminum and a solution of rubber in an organic solvent.[1] The rubber solution is prepared by first depolymerizing the rubber either by milling it excessively or by heating it at high temperatures with the solvent. Such a solution is of low viscosity and adapted to spraying operations. At the same time it contains sufficient rubber to embed the aluminum powder in the layer of rubber laid down from the solution. To such a solution is added a coloring material as eosin lake. This mixture is considered as a rubber ink.

The aluminum powder and rubber ink are mixed in various proportions according to the luster on the article desired. Suitable proportions of the ingredients follow:

Blue ink	20 fluid ounces
Aluminum powder	1 ounce avoirdupois
Solvent	16 fluid ounces

Two other formulae follow:

Red ink	12 fluid ounces
Aluminum powder	1 ounce avoirdupois
Solvent	20 fluid ounces

Green ink	14 fluid ounces
Aluminum powder	1 ounce avoirdupois
Solvent	16 fluid ounces

The solvent is any of the naphtha solvents and is added to give the mixture the proper fluidity.

The aluminum and rubber ink are kept in intimate mixture by continual stirring or shaking which may be effected as an additional operation in which the mixture is applied.

Application may be by spraying the mixture under air pressure, using the ordinary type of spray gun, by dipping the article into the mixture, or by brushing it onto the surface. The article, if in the unvulcanized state when the mixture is applied, is then vulcanized in the ordinary manner. If in the vulcanized state when the mixture is applied, it may be finished by merely drying the mixture, or in addition the mixture may be treated with sulphur chloride or bromine to remove surface tack. The ink may contain vulcanizing agents if desired.

This process is applicable to a large variety of rubber articles such as bathing caps, toys, hot water bottles, bathing shoes, golf balls, gloves, aprons, bibs, playing balls, raincoats, overshoes, etc.

[1] U. S. patent No. 1,940,315, Dec. 19, 1933.

Effect of Oxygen Absorbers in Rubber[1]

A. A. Somerville[2]

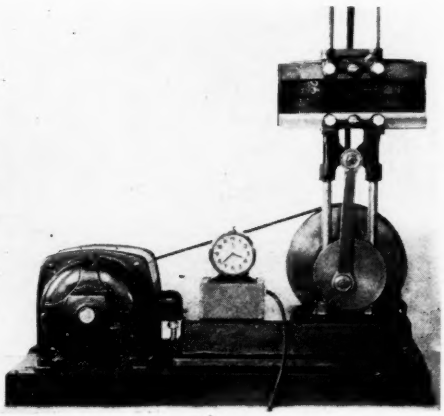


Fig. 1. De-Mattia Fatigue Testing Machine with Test Specimens

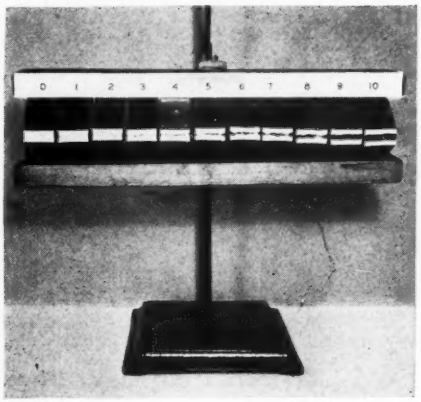


Fig. 2. Set of Specimens Showing Scale of Cracking

THE oxidation of vulcanized rubber and its deterioration as a result of oxidation are old and well-known phenomena, the outward characteristics of which are loss of tensile strength, brittleness, surface cracking under tension, and an increase in the amount of acetone-soluble material. The rubber increases in weight as oxygen is absorbed. In this species of oxidation, or aging, the oxygen is mostly derived from the atmosphere.

Oxygen Content of Rubber

Much less is known about the oxygen contained in the interior of a piece of vulcanized rubber. That such oxygen exists in rubber goods is generally known. Williams and Neal[3] have determined the amount of oxygen which remains dissolved in pure gum vulcanized rubber under different conditions of temperature and pressure. For example, at 760 mm. and 29° C. (somewhat higher than average room temperature) rubber can hold dissolved 12.5 cc. of oxygen per 100 grams, according to these authors. This is equivalent to about 0.018% by weight. Besides this, the compounding of rubber with certain pigments and fillers may introduce still greater proportions of oxygen. Carbon black, for instance, is known to contain considerable quantities. The amount of oxygen held by carbon black varies with the source and treatment of the material, but Johnson[4] has shown one sample of carbon black to contain 5.76%. The oxygen in carbon black appears to be held in a peculiar state which can be considered neither gaseous adsorption nor chemical combination with the carbon.

It is therefore clear that many rubber compounds made with ordinary compounding ingredients, and particularly with carbon black, may contain appreciable quantities of oxygen. The function and fate of this oxygen in vulcanization and during the subsequent life of the rubber is obscure and speculative, but it is not unreasonable to suppose that it must have a bearing on the aging properties and service obtainable from the rubber article. It is well known that carbon black compounds age more rapidly than similar compounds made with other fillers, or with none. It is probable that this poor aging property of carbon black, which offsets to a considerable extent its other valuable qualities, is related in some way to its appreciable oxygen content.

Besides the usual manifestations of deterioration in rubber goods, such as tensile loss and brittleness, there is another well known in articles subjected in service to often repeated dynamic strain such as bending or stretching, but which does not appear in those that remain at rest. This defect is known as flex-cracking. The rubber surface in the region of the bending or flexure gradually develops small cracks. As flexing continues, these cracks increase in length and depth and in time will traverse the whole thickness of the rubber, which is not necessarily deteriorated in the ordinary sense of the word. Flex-cracking is a defect found most commonly in tire treads and sidewalls, conveyer belt covers, footwear uppers, and rubber soling—all articles in which continued flexing forms an important part of the service which they must deliver. From a commercial point of view flex-cracking is a serious defect because, apart from its effect on appearance, it may ruin an article long before its useful span of life has been completed.

Flex-cracking has become a particularly acute problem in the tire industry in the last five or six years because of (1) structural changes in tires, which have accentuated the degree of flexing of the tire in service, and (2) the gradually increased loading of tread compounds with carbon black in attempts to improve the abrasion resistance. While increased loading with carbon black has largely

[1] Reprinted from *Ind. Eng. Chem.*, Jan., 1936, pp. 11-17. Paper presented at the meeting of the Division of Rubber Chemistry of the A. C. S., Akron, O., Sept. 30 and Oct 1, 1935.
[2] R. T. Vanderbilt Co., 230 Park Ave., New York, N. Y.
[3] Ira Williams and A. M. Neal, *Ind. Eng. Chem.*, 22, 874 (1930).
[4] C. R. Johnson, *Ibid.*, 21, 1288 (1929).

solved the problem of abrasion resistance, this success has been offset by an increased tendency to flex-crack, which has prevented still larger proportions of carbon black from being used. Larger proportions of carbon black would undoubtedly be used if more effective means of controlling flex-cracking were available.

Causes of Flex-Cracking

Neal and Northam[5] have studied flexing in nitrogen, oxygen, air, and ozonized air, and have shown that cracking is due to oxidation rather than to mechanical fatigue or to the possible production of minute quantities of ozone by static electric discharges at the points of flexure. Neal and Northam found that the rates of deterioration on flexing in air and in oxygen were approximately the same; that deterioration in nitrogen was very much slower than in air or oxygen; and that the addition of an antioxidant (phenyl-β-naphthylamine) protected the rubber in air or oxygen but not in nitrogen. These authors concluded that the effectiveness of the antioxidant probably lies in its retarding action on oxidation of the rubber by external oxygen and that no effect could be expected from the antioxidant in an atmosphere of nitrogen. They explain the fact that deterioration (cracking) of the rubber in nitrogen, though much slower than in air or oxygen, did finally set in, by pointing out that the rubber contained some oxygen dissolved[6] and also adsorbed on the pigments.

The amount of oxygen which rubber can hold dissolved under ordinary conditions is very small, but compounding ingredients, especially carbon black, may carry into the rubber much larger amounts. The important point is that these investigations have brought out the significance of oxygen held within the rubber as distinguished from atmospheric oxygen in contact with the rubber surface. The ordinary antioxidant tends to prevent deterioration due to the latter, but does not seem to offer much protection against the former.

The use of antioxidants has been to date the principal chemical means of combating flex-cracking. Some of these agents—for example, phenyl-β-naphthylamine—exercise considerable protective action against flex-cracking while others have little or no effect—for example, *sym*-dinaphthyl-*p*-phenylenediamine. The fact that some materials, which have good antioxidant properties, have little effect on flex-cracking proves that flex-cracking and deterioration are separate and distinct problems. The selection and use of age-resisters for various purposes, including resistance to flex-cracking, have been described by Crawford.[7] Other factors also have a bearing on the resistance of rubber to flex-cracking. Street[8] has discussed the harmful effect of grit in carbon black. This, however, is a mechanical rather than a chemical effect. It is obvious that, to obtain the best flex-cracking resistance from any given compound, the ingredients should be as free from hard or coarse particles as possible.

Taking these facts into consideration, and particularly that commercial antioxidants act chiefly catalytically[9] to prevent oxidation and do not appreciably absorb oxygen, the author believed that, if means could be found of absorbing or removing the oxygen dissolved or held in the rubber, a greater degree of resistance to flex-cracking than that obtained from an antioxidant alone might possibly be accomplished.

[5] A. M. Neal and A. J. Northam, *Ibid.*, 23, 1449 (1931).
[6] These authors quote Williams and Neal[9] as having shown that at 37° C. the solubility of oxygen in rubber is greater than 1.0%. This is evidently a misquotation because the data in the article of Williams and Neal show the solubility of oxygen in rubber at atmospheric pressure and ordinary temperature to be of the order of 0.018%.
[7] R. A. Crawford, *Ind. Eng. Chem.*, 26, 931 (1934).
[8] J. N. Street, *Ibid.*, 24, 559 (1932).
[9] G. T. Kohman, *J. Phys. Chem.*, 33, 226 (1929).

Many preliminary experiments were made. Batches of tread stock were exposed to vacuum treatment; others were compounded with metallic powders and combinations, such as zinc, iron, and lead powders, and aluminum amalgam. Others again were treated with such oxygen-absorbing materials as yellow phosphorus and benzaldehyde. Many of these tests brought negative results, but a sufficient number of them showed enough improvement over the effect of the antioxidant to warrant the belief that the idea of oxygen absorption within the batch would provide a sure means of controlling flex-cracking, if a practical and efficient oxygen-absorbing medium could be found.

Organic Oxygen Absorbers

The development of a practical solution of the problem has been completed within the last year in the use of certain oxygen absorbers or strong reducing agents, among which the substances known as photographic developers are particularly useful. The object of this paper is to describe the application of these materials in rubber compounds and to show their effectiveness in reducing the tendency to flex-crack.

Photographic Developers

Modern photographic developers have different oxygen-absorption rates. It was found that those which in an alkaline solution absorbed oxygen most powerfully also had the greatest effect in retarding flex-cracking. The most efficient were found to be (1) pyrogallol and (2) quinol (hydroquinone). On the basis of equal weights, pyrogallol absorbs oxygen roughly four times faster than quinol. It has considerably greater effectiveness in reducing flex-cracking; hence most of the data shown here are those obtained with pyrogallol.

Pyrogallol and Quinol

Both pyrogallol and quinol have been referred to in the literature as antioxidants, and the latter seems to have been used as such to a limited extent. Numerous bomb aging tests made in this laboratory, however, have failed to show that pyrogallol has any age-resisting properties. This oxygen absorber cannot therefore be regarded as an antioxidant for rubber in the modernly accepted sense of the word. Pyrogallol has practically no oxygen-absorbing capacity except in an alkaline medium; hence, if it is to be used as an absorber of oxygen in rubber, a suitable organic base must also be provided. Numerous bases have been found effective, but the most satisfactory and practical are the ethanolamines. These are non-volatile and, being extremely water-soluble, they tend to carry traces of moisture into the mix which help to render the pyrogallol-ethanolamine combination oxygen-absorbent. Pyrogallol alone has a strong retarding effect on vulcanization. This retardation is overcome by the base, the proportion of which may be adjusted to compensate for the loss of curing speed in most compounds. The base thus serves a double purpose.

Antioxidants Plus Oxygen Absorbers

If small proportions of pyrogallol and ethanolamine are added to a mix without an antioxidant, they have very little effect. The flex-cracking tendency of the compound may be reduced slightly; the aging is practically unaffected.

If, however, the compound contains an antioxidant, a very great increase in the resistance to flex-cracking over that due to the antioxidant is produced. This increase in resistance to flex-cracking produced by the pyrogallol-ethanolamine combination has been found with most of

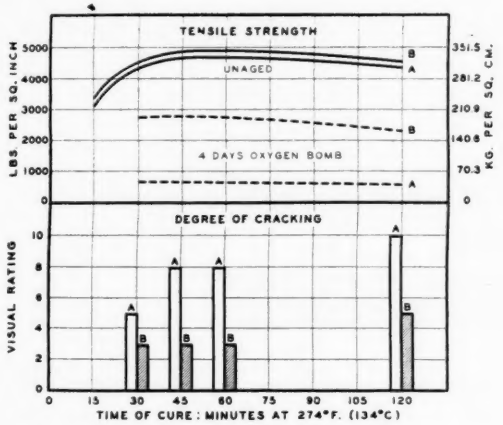


Fig. 3. Effect of Antioxidant (AgeRite Powder) in a Carbon Black Stock

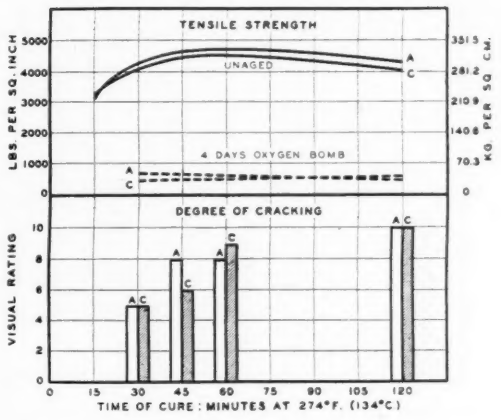


Fig. 4. Effect of an Oxygen Absorber (Pyrogallol-Ethanolamine)

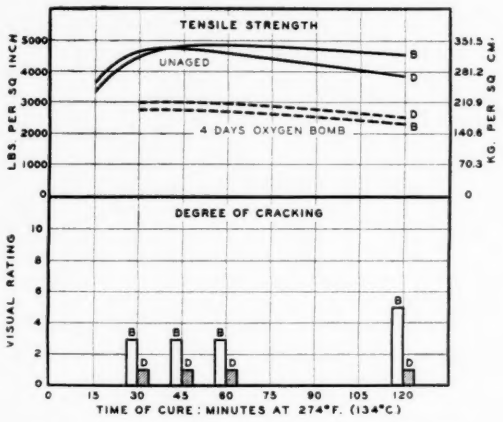


Fig. 5. Effect of AgeRite Powder Plus Pyrogallol-Ethanolamine

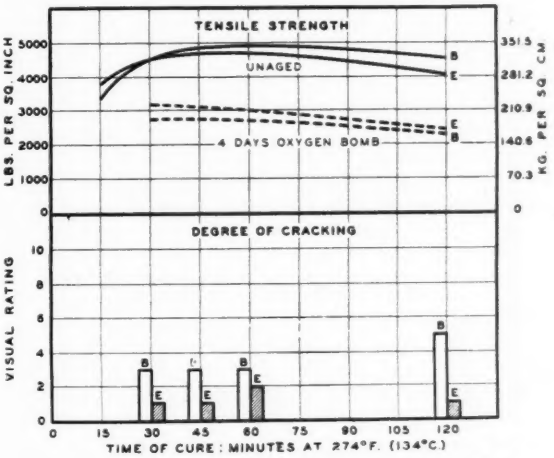


Fig. 6. Effect of AgeRite Powder Plus Pyrogallol-Quinol-Ethanolamine

the strong commercial antioxidants. In most cases the improvement is far greater than can be produced by largely increasing the dosage of antioxidant. Outstanding results are therefore obtained only when the following combination of materials is used: a catalytic antioxidant, an oxygen absorber, and an organic base.

If quinol is substituted for pyrogallol, a smaller increase in the resistance to flex-cracking over that obtained by the antioxidant alone is produced. Quinol, however, may be partially substituted for pyrogallol without noticeable diminution of the effect of the latter. Quinol has a slight accelerating effect on the rate of cure, while pyrogallol retards strongly. Partial substitution of the pyrogallol by quinol has therefore some advantage from the point of view of curing rate.

The proportions of oxygen absorber and base required to produce the maximum effect are small and together do not need to exceed the amount of antioxidant used. Thus, with 1% of antioxidant—a commonly used proportion—not over 0.5 to 1% of pyrogallol together with 0.25 to 0.5% of ethanolamine needs to be used.

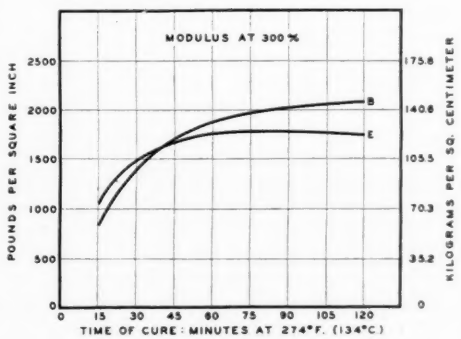


Fig. 7. Effect of Pyrogallol-Ethanolamine on Modulus

The data given later show the effect of pyrogallol and a mixture of pyrogallol and quinol in a typical carbon black tread compound. Carbon black compounds are used for flex-cracking tests because most of the rubber goods which are subject to flex-cracking are made from carbon black compounds. Increasing the amount of carbon causes increased tendency to crack, so that it is highly desirable to have a means of minimizing or substantially reducing the cracking tendency.

The tests for flex-cracking tendency were all made on a DeMattia fatigue testing machine (Figure 1):

The test pieces consisted of mold-cured strips, 75 mm. wide, 6 mm. thick, and 150 mm. long, having a half-round groove of 3-mm. radius across the middle of the strip to act as a flexing zone in simulation of the depression in a non-skid tire tread. The test strips were set in the jaws of the machine, twelve at a time, with no initial stretch, and flexed through an angle of 180° at the grooves; these were the outer or stretched surfaces when the strips were bent double.

In the case of tread and other high-grade carbon black

stocks the strips were examined after 50,000, 100,000, and 150,000 flexing cycles, and the degree of cracking of each specimen was visually estimated.

In judging the degree of cracking of the flexed specimens, an arbitrary scale of 0 to 10 was used; 0 represented the condition of a fresh or uncracked specimen, and 10 indicated that the specimen was completely cracked through. Figure 2 represents a set of specimens which show the scale of cracking from 0 to 10. The grooves were painted white while the strips were straightened to close the cracks. On bending them back again the cracks appear to good advantage.

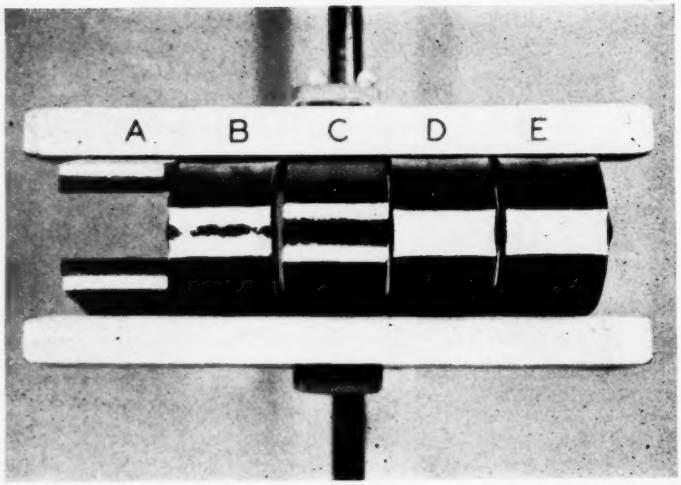


Fig. 8. Specimens Cured 120 Minutes and Flexed 150,000 Cycles

A. Blank without Antioxidant; B. With Antioxidant Alone; C. Pyrogallol-Ethanolamine Alone; D. Antioxidant Plus Pyrogallol-Ethanolamine; E. Antioxidant Plus Pyrogallol-Quinol-Ethanolamine

Usually four cures from each compound, including a slight undercure and an overcure, were flexed. In Table 1 the numerical values assigned to the specimens after each examination (flexing period) are given by cures in three columns representing the three flexing periods. The sum total of the four values in any column, therefore, gives in an approximate way the condition of the stock as a whole after the number of flexures indicated above that column. By studying the sum totals of the columns, an easier comparison of different compounds can be made than by studying the individual values for each cure.

Compound *A* represents a typical carbon black tread stock without an antioxidant. It ages poorly, as shown by the oxygen bomb test, and develops cracks readily when flexed.

B shows the effect of adding an antioxidant (phenyl-β-naphthylamine), a substantial improvement in the resistance of the compound to both aging and flex-cracking results. Figure 3 gives a graphical comparison of *A* and *B*.

C shows the effect of adding the oxygen-absorbing combination, pyrogallol-ethanolamine, without any antioxidant; there is no improvement in aging over the original blank stock, *A*, and the resistance to flex-cracking is only slightly better than that of the blank. The oxygen absorber has therefore no antioxidant power. Figure 4 compares *A* and *C*.

In compound *D* the oxygen-absorbing combination is used together with the antioxidant; here the aging resistance imparted by the antioxidant is unimpaired (if anything, slightly enhanced), and the tendency to flex-cracking is greatly reduced. *B* and *D* are compared in Figure 5.

E is another example of the combined use of antioxidant and oxygen absorber; the latter is a combination of pyrogallol, quinol, and ethanolamine. The mixture of pyrogallol and quinol retards the rate of cure less than does pyrogallol, so that a smaller proportion of ethanolamine is required for adjustment. The effect of the mixture on flex-cracking tendency is practically the same as that of pyrogallol. Figure 6 compares *B* and *E*.

In Figure 7 the modulus curves of *B* and *E* are compared. The oxygen-absorbing combination has the effect of slightly increasing the modulus in the early cures and lowering it in the longer cures, so that the curves cross.

Figure 8 shows photographically the comparative resistance of the five compounds *A*, *B*, *C*, *D*, and *E* to flex-cracking. The specimens were 120-minute cures which had received 150,000 flexings. The effect of the oxygen-absorbing combinations in *D* and *E* is striking; the specimens were painted white before photographing to show the cracks.

(To be concluded)

TABLE 1. EFFECT OF ANTIOXIDANT ALONE, OXYGEN ABSORBER ALONE, AND ANTIOXIDANT PLUS OXYGEN ABSORBER

	A	*B*	*C*	*D*	*E*
Smoked sheets	100	100	100	100	100
Stearic acid	4	4	4	4	4
Pine tar	2	2	2	2	2
Zinc oxide	5	5	5	5	5
Carbon black	45	45	45	45	45
Sulphur	3	3	3	3	3
Mercaptobenzothiazole (Captax)	1	1	1	1	1
Phenyl-β-naphthylamine (AgeRite Powder)	..	1	..	1	1
Pyrogallol	..	..	0.75	0.75	0.5
Quinol	..	..	..	..	0.25
Ethanolamine	..	..	0.5	0.5	0.25
Total	160	161	161.25	162.25	162.00

Tensile Properties* before Aging

Press Cures at 274° F. (134° C.)	*a*	*b*	*c*	*a*	*b*	*c*	*a*	*b*	*c*	*a*	*b*	*c*	*a*	*b*	*c*
Min.															
15	660	3090	640	820	3320	630	980	3220	580	1095	3620	585	1030	3750	620
30	1205	4320	610	1395	4520	605	1355	4180	610	1485	4720	595	1495	4510	590
45	1555	4630	580	1715	4850	580	1560	4390	580	1640	4690	575	1685	4630	565
60	1730	4720	560	1835	4860	550	1550	4580	570	1720	4600	530	1780	4740	560
90	1950	4500	505	2010	4750	530	1635	4300	565	1715	4300	530	1720	4360	545
120	2110	4410	480	2080	4570	515	1700	4070	560	1675	3860	520	1750	4120	530
Tensile Properties after 4 Days of Aging in Oxygen Bomb [70° C. (158° F.) and 300 Pounds per Square Inch Pressure]															
30	570	680	385	1035	2750	585	...	470	240	1520	2960	540	1410	3140	545
45	610	680	355	1300	2760	545	...	465	210	1650	3030	530	1550	3110	535
60	..	560	285	1450	2700	500	...	455	190	1700	2930	480	1680	2950	480
120	..	575	220	1680	2330	500	...	590	190	1760	2500	430	1735	2360	400
Flex-Crack Rating (Unaged), 50,000, 100,000, and 150,000 Flexures on DeMattia Machine															
30	1	3	5	1	2	3	1	3	5	0	0	1	0	0	1
45	2	6	8	0	2	3	1	3	6	0	0	1	0	0	1
60	2	5	8	0	2	3	2	6	9	0	1	1	0	1	2
120	8	10	10	1	2	5	2	6	10	0	0	1	0	0	1
Total	13	24	31	2	8	14	6	18	30	0	1	4	0	1	5

* *a* = stress at 300%, pounds per square inch; *b* = tensile strength, pounds per square inch; *c* = elongation at break, per cent.

Factory Lighting

Adequate Illumination Promotes Industrial Efficiency

Dean M. Warren [1]

Good Yard Lighting Is Protection against Depredation and Thievery

DURING the past few years a new concept of artificial lighting has come into widening appreciation. This concept, born from researches in seeing, proposes the use of lighting in scientifically prescribed amounts for every task in order that human energy and human eyesight may be conserved.

The necessity of aiding the eyes in every possible way is greater today than ever before because present-day working standards impose a heavy tax upon our powers of vision. We think of these modern times as an age of labor-saving devices in which machines and efficient production methods have largely relieved men of the strain of labor. However these very products of civilization, while lifting burdens from the backs of human beings, have imposed greater strain on our eyes, minds, and nerves. Machines and manufacturing processes must be controlled by the sight and intelligence of the operator. Modern production requires rapid inspection, and one must see quickly to keep pace with it. The work must continue unvarying, whether the day is dull or bright, and it must often be carried on through the night.

Light Volume Requirements

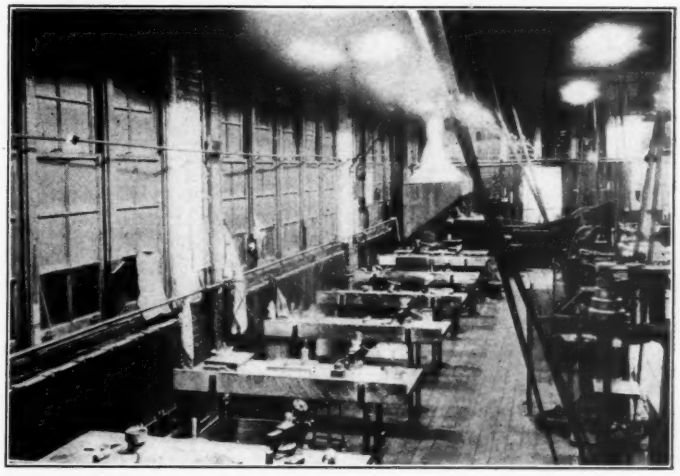
There is no danger of obtaining too much illumination under sources of artificial lighting properly applied. The best lighting systems supply really meager light when compared to daylight. This is apparent when we compare five to ten footcandles of average indoor values with 500 to 10,000 footcandles of outdoor daylight. (When we speak of footcandles, we mean units of light, just like we speak of degrees and mean units of temperature. One footcandle, for instance, is the amount of illumination on an object that is held one foot away from a standard candle. Two footcandles is the amount of illumination produced on an object one foot away from two candles, etc.)

The eye will function and distinguish objects under lighting of less than one footcandle. However, to avoid premature aging of the eyes and needless expenditures of nervous energy it is necessary to provide more light than just enough for seeing. This can be most economically done today because of the progress the electrical industry has made. The cost of energy, equipment, and lamps has been constantly decreasing; lamp efficiencies, too, have been materially increased. The lighting dollar now purchases ten times as much as it did twenty-five years ago, and twice as much as it did only ten years ago.

Light Measurement

It wasn't so many years ago that measuring light was a matter of the layman's saying, "The illumination looks pretty good in here." Today guesswork has been ruled out of the picture. After innumerable tests and experiments science knows how much light ought to be prescribed as a minimum for every visual task that human eyes are called upon to perform. Lighting engineers, furthermore, have developed a simple instrument that measures illumination as easily as the ordinary thermometer measures temperature. This instrument is known as the Light Meter and is available to everyone. Don't guess how much light your employes are getting or how much they should get. Know!

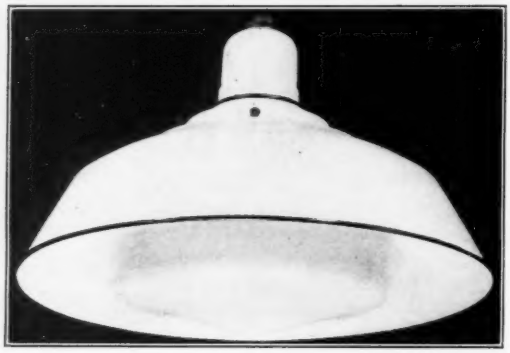
The desirable quantity of light for any particular

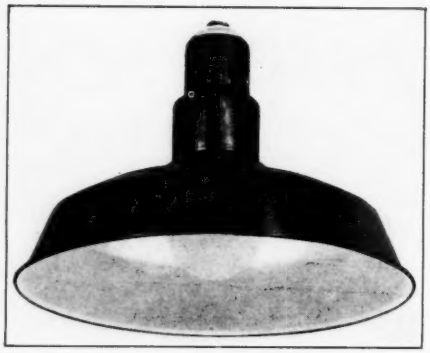


On Work Benches, Where Close Visual Application Is Required, Supplementary Lighting Provides the Necessary "Seeing Light"

[1] General Electric Co., Engineering Department, Nela Park, Cleveland, O.

The Glassteel Diffuser





The RLM Dome Reflector

installation depends upon actual conditions, such as the accuracy of the operation, the fineness of detail to be observed, and the color of the goods worked on or handled. For instance, compounding mills, fabric preparations, and stock cutting require only ten footcandles of illumination, whereas operations requiring closer visual application, such as bead building, pneumatic tire building and finishing, trimming and treading, need at least twenty footcandles of light. Such illumination may be provided by a general system of overhead lighting.

For tube assembly and inspection where critical seeing is demanded, it is often desirable to build up the illumination to one hundred or more footcandles. These higher levels can be provided most economically by supplementary units properly located. In providing supplementary lighting it is first necessary to have a good general system of illumination so that severe contrasts will not be set up. In no case should a ratio of more than ten to one between the supplementary and the general lighting be used. For example, if the general system provided ten footcandles, a total of one hundred footcandles could be comfortably provided by the supplementary system.

Equipment Selection

In order that the light given off by the incandescent lamp be properly directed, distributed, and diffused and in order that the eyes of the workmen may be protected from glare, it is essential that properly designed reflectors be employed. These reflectors should be selected for their efficiency, durability, cost, and ease of maintenance.

A direct type of unit, such as the Glassteel Diffuser, may be used in the more important manufacturing areas. This unit consists of a porcelain enameled steel reflector, fitted with an opal glass diffusing globe which completely encloses the lamp, thus combining in a single lighting unit the light-directed qualities of poreclain enameled reflectors with the light-diffusing qualities of an opal glass globe. Small openings in the top of the reflector allow a small amount of light to pass upward to provide some light on the ceiling.

For lighting other sections of the factory RLM (Reflector and Lamps Manufacturers) Standard Dome reflectors may be used. This unit consists of a porcelain enameled steel reflector of high efficiency and of such contour that there is a minimum of direct glare. White Bowl MAZDA lamps should be used with this unit. These lamps have the lower part of the bulb sprayed with a light coating of enamel which transmits only a small amount of light without producing excessive brightness or harmful glare. The enamel provides a smooth, durable surface which can be easily cleaned.

In any lighting system it is of particular importance that the outlets be so located that a fairly even level of illumination will be obtained. In rooms of the usual ceiling height of ten to fourteen feet, to secure uniform distribution the spacing between outlets should not exceed the mounting height above the floor. In rooms having higher ceilings the spacing should not exceed one and one-half times the height of the lighting unit above the work plane. The distance from the side walls to the first row of units should not exceed one-half the permissible spacing. Where desks, work benches, or machines are located close to the wall, the distance of the units from the wall should not exceed one-third the permissible spacing.

Lighting Cost

From a humanitarian standpoint the value of proper lighting cannot be adequately estimated. Its contributions to health, well being, and the joy of living are without price and will certainly outweigh the dollars and cents paid for it.

An analysis by the United States Department of Commerce of the total production cost of the manufacturing industry shows the major accounting items distributed as follows: salaries, 5.9%; labor, 16.5%; raw material, 52.0%; fuel, light, and power, 2.7%; miscellaneous, 22.9%.

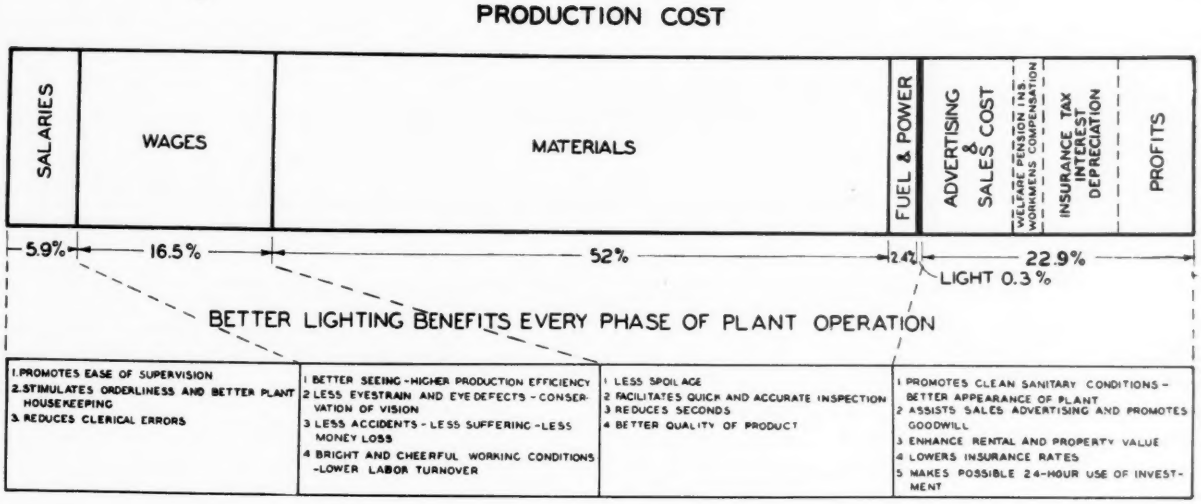
The last figure must include not only advertising and sales costs, insurance, taxes and employes' welfare and pension plan, workman's compensation, depreciation and maintenance, but also the profits of the enterprise. Of the 2.7% spent for fuel, light, and power it is estimated that only 0.3% is spent for the lighting. This estimate is based on factory survey data, estimates from lamp consumption, etc.

In the accompanying chart portraying this relation the "Cost of Lighting" segment is so small that it had to be enlarged out of scale to have it show up at all. Yet lighting has a beneficial effect on every phase of manufacture. This statement is a sweeping one, but note under the various subdivisions of this chart the relation of lighting to plant operation.

Lighting Value

A good system of artificial light offers better seeing, is constant in quality, and unvarying in its effect on the eye, and will pay for itself through decreased production costs. This is not surmise. Good lighting materially increased the rate of working in an interesting laboratory experiment conducted some months ago. The level of illumination, for test purpose, was raised from three to twelve footcandles, and the results show that the efficiency of some individuals was increased by as much as 40%.

Classification of Work	Increase in Rate of Working
Those with Better Eyes	14%
Those with Poor Eyes	22%
The Fast Workers	28%
The Slow Workers	40%



From these figures it is obvious that good lighting is an equalizer in human performance by helping those most who need help most.

In relating the subject of lighting to industrial accidents it is estimated that on the average a company loses $1,000 every time a laborer suffers a "lost time" injury. This represents the sum paid for compensation, for doctor bills, hospital fees, and such indirect costs as labor turnover, the value of lost production, and damaged machinery and material. This puts the total cost of accidents in American industry each year at about $1,500,000. According to R. E. Simpson, of The Travelers Insurance Co., there is warrant for assuming that defective vision and deficient or unsatisfactory lighting installations are contributing factors in more than 15% of these accidents. This means that about a quarter of a billion dollars could be saved each year by good lighting.

Better lighting reduces the possibility of spoiling materials and ruining tools and machinery through faulty work. Errors can be detected quickly, and the fault corrected before costly damage is done.

Good lighting reduces eyestrain, which means fewer headaches and aggravated minor ailments, responsible for most lost time and discontent. The worker goes home less tired and with more energy for recreation, which conserves health and makes for better contentment. A tired and run-down condition on the part of the employe may cause carelessness and accidents. By conserving eyesight good lighting conserves worker's capacity and earning power.

Lighting Factory Grounds

Floodlighting is a practical and economical solution to the problem of providing illumination for industrial yards. There is really a three-fold need of such lighting. It enables work to be carried on after the sun has set. It helps protect the company against thievery and depredation. It facilitates employes in parking their cars.

If protection is the prime consideration, the units should be so located that the watchman can see the intruder without himself being seen. This statement generally means that the lighting units are best located on the building, with their beams pointing toward particularly vulnerable locations.

Where the lighting is to be used for strictly utilitarian purposes, a different unit location is necessary in order that shadows be eliminated. Thus the light should come from several directions instead of predominantly from one direction. Also, the units should be mounted high enough to prevent glare in the eyes of the workmen.

Material Selection

(*Continued from page* 31)

for continued use for many kinds of footwear and, as a quick and satisfactory means of adjustment to ankle sizes, it has few equals.

Finish Must Catch the Eye

The final appearance of marketable commodities must appeal to the eye. If they fail in this respect, sales are lost; and even though the goods are of practical value, they move slowly from the dealer. From a glimpse of show windows it becomes more evident each season that rubber footwear is being thoughtfully styled. The introduction of leather-like surface designs, contrasting color schemes, multiple tone effects, and numerous other attractive features in appearance have given the feminine buyer an opportunity to select more individual shoe covering.

Leather footwear has provided much variety in style for the wearer. Shoes for heavy work, evening dress, sportwear, and home relaxation all have their call in large volume in this vast industry. There seems to be no reason why the market for rubber footwear, so closely allied to that for leather shoes, should not also be broad enough to absorb in large quantities the newer styles as well as the more practical models. Skillfully tailored, higher grade products which have color as well as utility appeal are always sought by fastidious buyers whose purses are not limited to the general run of merchandise.

Proper selection and application of shoe component materials is not being overlooked today by most manufacturers. It is clearly recognized by them that materials research must be diligently carried on as an important branch of the gum footwear manufacturing industry.

Editorials

A Prediction

MEASURED by crude rubber consumption, the rubber industry of the United States continued its growth during 1935 to a new all-time high and that despite the fact that industry in general has recovered from depression lows to only about 80% of normal levels. The extent of the ever-increasing application of rubber to the needs of humanity is revealed when one realizes that the 497,150 long tons of rubber used last year was 106% of that of the previous banner consumption year, 1929; 316% of that used in the World War year, 1917; and 2,200% of that utilized in the then-peak year, 1899, at the turn of the century.

Scientists and manufacturers constituting the rubber industry, and others catering to it, have developed many new and valuable rubber quality enhancing chemicals and have learned also of new values to be obtained by extending the use of those previously known. Thus the potential properties of rubber have become so varied and so controllable that it lends itself to new and important fields of application. That rubber must be compounded to produce the required service characteristics of each product is now well known and displaces the old belief that quality was proportional to the purity of rubber content.

Rubber consumption will undoubtedly undergo further enormous increases in years ahead, and at the same time compounding ingredients will increase in even a higher order as has been true in the past one and one half decades.

Eliminate Traffic Tragedy

THE executive committee of the National Safety Council has undertaken the sponsorship of a five-year plan to bring about a 35% reduction of traffic fatalities, which have reached the staggering yearly total of approximately 36,000 killed with a background of more than a million injured. This laudable responsibility is best explained in the exact words of the resolution adopted November 18, 1935, by the committee. It is as follows:

"Whereas, the untimely deaths of 36,000 of our people by motor vehicle accidents last year and the injury of a million and a quarter others—of whom 150,000 will be crippled for the rest of their days—presents a most serious challenge to all who believe in a well-ordered society and the sanctity of human life; and

"Whereas, these human losses are accompanied by a staggering economic waste of at least a billion and a half dollars annually; and

"Whereas, remarkable reductions and low death rates already achieved in certain states, cities, and other population units, show that these unnecessary and costly tragedies can be not only controlled, but actually reduced, by known methods proved by experience;

"Therefore be it resolved that the National Safety Council does solemnly urge upon all our people, through their state and local governments and organizations—and as individuals—to reduce motor vehicle deaths and casualties by at least 35% by the end of the year 1940, in each state, county, and city; and

"Be it further resolved that the Council does hereby pledge its own whole-hearted assistance and the active and earnest efforts of its thousands of members everywhere, and cordially invites the cooperation of all other organizations and agencies interested in safety on our streets and highways, to the end that during this five-year program at least 38,000 lives shall be saved and the killing and maiming of little children and all our people shall cease upon our highways."

The serious minded cooperation of every man, woman, and child in the United States is solicited, expected, and deserved. That cooperation can be given to some extent by each person resolving to make his personal actions trebly safe; and more by safeguarding the actions and habits of others; and still more by directing organized effort to these ends, and to the proposal of new traffic regulatory suggestions. Naturally the height of cooperative effort is achieved by doing all of these things. After all the immunity of any one of us to this sort of tragedy is no greater than was once that of any of those now among the tremendous toll of past years. We can build this immunity for ourselves, our families, and our friends only by our diligent and intelligent cooperation in this vital undertaking.

Announcement

"ANNALS OF RUBBER," a chronological record of the important events in the history of rubber, published serially during the past one and one half years, will be issued in pamphlet form in the near future. This action is prompted by the widespread demand for such a record.

D C McPherrin

EDITOR

What the Rubber Chemists Are Doing

Spot Method for Testing Chemical Resistance of Paint Coatings[1]

THE common practice of immersing a panel into a reagent has the disadvantage of requiring an individual panel for every test made. This proves cumbersome and expensive. Thinly coated panel corners also break down, making accurate recordings difficult. Another method, that of putting several drops of a reagent on a panel and covering with a watch glass, proved unsatisfactory from the standpoint of confining the reagent to one particular spot. Tilting will shift the reagent, and inspection will be difficult on account of the tendency of the reagent to collect on the inner edge of the glass. In the event the watch glass seal is not tight, further difficulties arise in obtaining accurate data due to an increased concentration of the reagent resulting from evaporation.

For these reasons the spot method was developed in the Sherwin-Williams laboratories. This permits the spraying of a uniform coat on a panel. Several reagents can be tested on the surface of each, and recordings may be kept along side. An airtight seal is made as follows. Rubber rings are cut from 1/16-inch inner tube stock. The inside diameter of the rings is 1⅛ inches, and the outside diameter 1¾ inches. After cutting, the rings are immersed into a melted mixture consisting of 50 parts paraffine, 20 parts carnauba wax, and 30 parts Halowax 1013. While the melting point of the mixture is about 200° F., it is advisable to hold the temperature of the melt between 250° and 300° F. to prevent solidification of the wax when rings are immersed.

Centers for the rings are marked off on the panel to be tested. The panel is then placed under a hot water tap reverse side up. This warming prevents chilling of the wax when the dipped rings are placed on the panel. Excess wax should be drained off the rings before placing them on the panel; then they should be pressed at several points to insure complete contact. As soon as the wax has cooled to the point where its surface gloss disappears, a 2,000-gram brass weight is applied to mold the top of the wax to a smooth, level surface. One c.c. of reagent may be poured into each ring by means of a pipette. Three-inch by two-inch microscopic slides are generally satisfactory for covers. Since they are of colorless glass, many observations may be made without removing them. When inspection of a particular spot is to be made, it is a simple matter to absorb the reagent into a swab of cotton to examine the paint surface.

This technique for making chemical resistance tests of a paint film is not only quick and easy, but is also accurate. The wax mixture indicated is not affected by any water soluble common acids or alkalis. Concentrations can be controlled by means of the seal, and all notations on reagent, film, time, and results can be recorded beside the ring on the panel. These panels may easily be kept for reference or observation at any time. This is a simple, inexpensive, and accurate method adaptable as standard laboratory practice.

[1] Reprinted from *Steel*, Feb. 4, 1935, p. 49.

Chlorinated Rubber

A. Nielsen

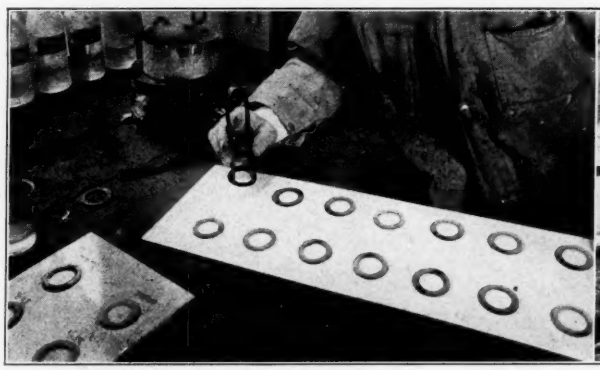
A REVIEW of progress in the technology of chlorinated rubber[1] is thus summarized, having been abstracted from a recent article.[2]

It is now realized that the technically useful products must contain upward of 60% of chlorine, preferably even as high as 68%, but the precise colloidal properties are still more important and depend on the details of the chlorination process. The chemical stability of chlorinated rubber was rather doubted a year or two ago, but the newest products are remarkably stable and resist such powerful attack as 50% caustic soda or potash, and boiling in benzene with metallic sodium.

The principal outlet for chlorinated rubber is in paints, varnishes, and lacquers. Almost any of the common solvents and solvent mixtures are suitable for these applications, and it is now certain that such resins as colophony, coumarone, vinyl, copal, gryptal, and gutta-percha resins all give homogeneous softened mixtures. On the other hand there are various bodies that do not mix easily and uniformly with chlorinated rubber, including such compounds as rubber itself, nitro- and acetyl-cellulose, phenol-aldehyde resins, wax (paraffin and ceresin), lanolin, and petroleum jelly. The usual nitrocellulose plasticizers, such as sipalin, tricresylphosphate, butyl stearate, etc., are suitable for use also with chlorinated rubber.

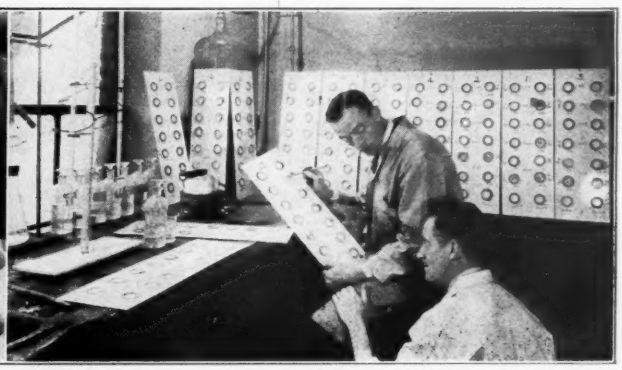
Although not vulcanizable in the or-

[1] *Kautschuk*, 11, 132 (1935).
[2] *Rubber Age* (*London*), Nov., 1935, p. 276.



Sherwin-Williams Co.

Placing Waxed Rings on Panel



Sherwin-Williams Co.

Observing Test Panels

dinary sense of the rubber-sulphur reaction, chlorinated rubber can be hot molded, and with the newer discovery and development of special polymerizing agents this branch of the subject may eventually become very important.

Not much has been added to our knowledge of the properties of the product, but investigations are being continued more keenly than ever. It is now known that long storage has no effect on the solution viscosity, or does chlorinated rubber develop the least smell, taste, or tendency to mold. These aging qualities are all of value for its development as a lacquer and paint film.

A. C. S. News

Spring Meeting

THE following notice was addressed to all members of the Rubber Division, A. C. S., by C. W. Christensen, secretary-treasurer of the division.

The next meeting of the American Chemical Society will be held in Kansas City, Mo., the week of April 13. The Rubber Division will hold its meetings on Wednesday afternoon, April 15, and Thursday morning, April 16. The headquarters and registration of the society will be at the Hotel Muehlebach, 12th and Baltimore Sts. It is suggested that the Rubber Division members make reservations at the Hotel President, 14th and Baltimore Sts., as this is the newest hotel.

It has not been decided whether the Rubber Division will hold its meetings at the Hotel President or in the auditorium where the rest of the society will meet. This information, as well as the complete program, will appear at a later date in the trade journals or the News Edition of *Industrial and Engineering Chemistry*.

Los Angeles Group

THE Los Angeles Group, Rubber Division, A. C. S., held a "Father and Son Nite" meeting in the Dungeon Dining Room of the Furniture Mart, 2155 E. Seventh St., Los Angeles, Calif., January 16, 1936, which was attended by sixty-three members and guests. The entertainment features consisted of a talking picture, "Big Job," presented by the Los Angeles Metropolitan Water District and discussed by M. W. Hawks, district engineer. The construction of the $220,000,000 Los Angeles Aqueduct for bringing water from the Colorado River, 152 miles below Boulder Dam, was very interestingly and informatively portrayed. T. Kirkhill gave an entertaining talk on the "Founding and History of the Kirkhill Rubber Co." C. P. Hall of the C. P. Hall Co., Akron, O., was an honored guest.

This meeting was planned and conducted by the new officers elected at the Christmas meeting held December 20, 1935. They are G. G. Balazs, Goodyear Tire & Rubber Co., chairman; E. L. Royal, H. M. Royal Co., vice chairman; and Carl E. Stentz, E. M. Stentz Co., secretary-treasurer. This group has fixed the first Tuesday of each month as the time for its regular stated night meetings.

Vulcanization by High Frequency Electrical Current[1]

Henri Leduc

HOMOGENEOUS curing in which the characteristics of the vulcanized product are the same at every point from center to the surface has not yet been achieved. Referring to the experience of the metallurgical industry with high frequency induction currents in heating metals, the author experimented with a view to developing a new method of electrical vulcanization. He used a rubber mixing containing a filler, every particle of which is electrically conductive. This was thoroughly dispersed in the mix, which was then placed in an alternating field of high frequency, and the temperature of the mix regulated as required.

The apparatus was a cylindrical, heat-insulated chamber about which spiraled an induction circuit, a metallic tube of fairly large diameter. Water was circulated through the tube to prevent overheating, and the usual measuring and regulating devices completed the equipment. Since then the apparatus and process have been modified so that an ordinary mix can be used. By the new process a mix of 100 parts pale crepe, 10 oxide of zinc, 3 sulphur, 1 stearic acid, and accelerator as desired, can be heated from 5 to 15° C. per minute in a suitable field.

The Leduc process was shown at the stand of the Office National des Recherches & Inventions at the Exposition of France d'Outre-Mer, held in Paris, November 28-December 15, 1935. The Syndicat du Caoutchouc thought so well of M. Leduc's work that they awarded him a prize of 4,000 francs.

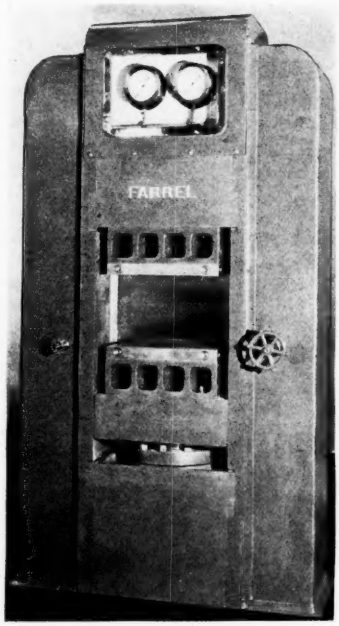
[1] *Rev. gén. caoutchouc*, Oct., 1935, pp. 18-19.

E. L. Royal

Carl E. Stentz

G. G. Balazs

New Machines and Appliances



Farrel-Birmingham Molding Press

Modern Press

THE press illustrated embodies principles of modern industrial design, with a self-contained hydraulic power unit using oil as the fluid medium. The press is designed especially for plastics and rubber molding operations although readily adapted to other work. It is of 100 tons capacity and has platens 20 inches square, with an opening of 12 inches between platens. The variable displacement pump with its driving motor is mounted on a steel bedplate over the top crosshead, which also serves as an oil reservoir. Steam and oil pressure gages are mounted in a white enameled depression on the front face of the top crosshead, behind a protective shatter-proof glass, and are illuminated by indirect lighting. The usual tie rods between top and bottom crossheads are dispensed with; instead rolled steel slabs are used as tension members. These slabs are finished to fit machined tongues that project from top and bottom crossheads, and adjustment is provided by patented adjustable tapered keys. The bottom crosshead is integral with the cylinder, which contains the hardened and polished ram. Interposed between the steam platens and the crossheads are ventilated grids to lessen heat transfer from the steam platens to the crossheads. Steam connections are provided for the upper and lower platens, with suitable clearance for their operation in the slab tension members.

The operation of the press requires the opening or closing of but one valve, and maximum pressure adjustment of the variable displacement pump may be made by a single manipulation of the control hand-wheel on the pump. This pressure adjustment, however, requires no attention once it has been set for the correct value for any particular operation. In line with the modern trend in industrial design, the appearance of this press is pleasing to the eye as all component parts not functional in the actual operation are enclosed, although readily accessible for inspection and maintenance purposes. Farrel-Birmingham Co., Inc., Ansonia, Conn.

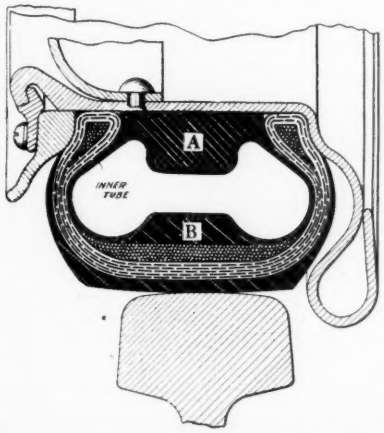
Pneumatic Tire for Rails

A PNEUMATIC tire for use on wheels of railway cars[1] has the construction and is applied as indicated in the cross-sectional sketch. The inner tube, when inflated, adapts itself to the irregular form left between the two cushioning strips *A* and *B*, the contact of which in case of deflation serves to carry the wheel load.

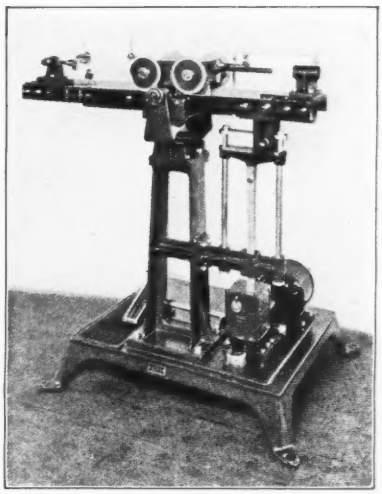
[1] U. S. patent No. 1,999,937, Apr. 30, 1935.

Incline Plane Tester

THE incline plane principle as applied in the tire cord testing machine is the most accurate known method of ascertaining tensile strength and elongation measurements on material of any kind because it applies a definite unit of load to the specimen per unit of time. The instrument pictured is of the motor-driven autographic recording type for tensile and elongation tests of tire cord and other materials requiring a machine capacity not exceeding fifty pounds. It is ruggedly constructed upon a cast-iron base and stands directly on the floor. It is designed to be used with the operator



Cross-Section of Pneumatic Tire for Rails



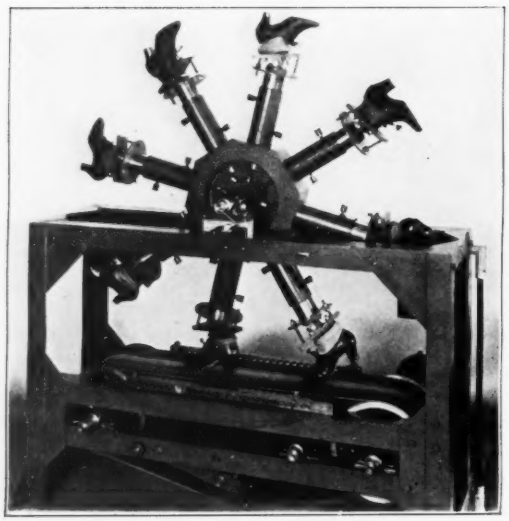
Scott Incline Plane Testing Machine

seated and is therefore controlled by a foot pedal which starts, stops, and reverses the machine. Thus the operator has the freedom of both hands to manipulate the specimen. The moving weight that applies the load instantly returns automatically to starting position at completion of each test. The recording device is a fixed-chart type with chart graduated to fractional readings in the load direction and to tenths of an inch in the stretch direction.

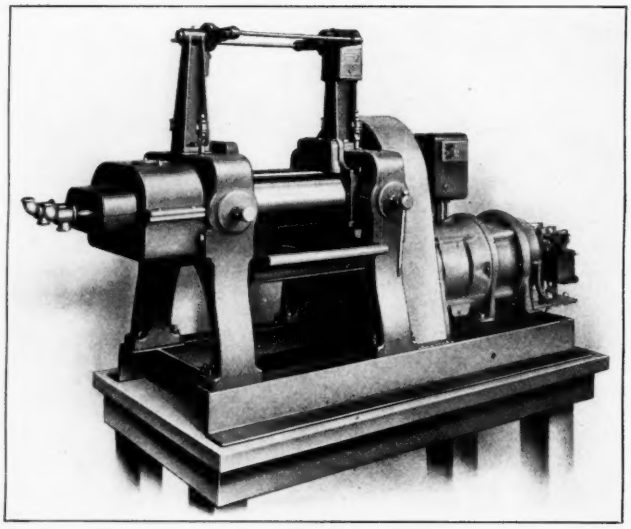
The plane is made of heavy steel bars, and the wheels on which the moving weight rolls are mounted on precision ball bearings. The shock of the moving weight rolling free, after the break of the specimen, is absorbed by a very large sponge rubber cushion mounted within the weight. The plane is lowered through a sliding crosshead carried on a steel rack controlled by a simple gear box which is driven by a quarter horsepower motor. Henry L. Scott Co., Providence, R. I.

Shoe Tester

THE novel mechanical contrivance here illustrated represents a testing machine designed at the Bureau of Standards for determining the comparative endurance of shoe upper leather, linings, stitches, and heels. The machine is designed to imitate to some extent the forces applied to a shoe in service. The mechanism, mounted on a framework of angle-irons, consists of eight radial cylinders having smoothly fitting pistons. These cylinders and their projecting pistons form, in effect, the spokes of a rimless wheel, and the whole is free to rotate about an axis. Four pairs of shoes, fitted to plastic rubber forms, are fastened to the



Testing Machine to Determine Wearing Qualities of Shoes



Thropp Laboratory Mill

movable pistons by adjustable hinged joints. The load applied to each shoe is controlled by an adjustable compression spring within the cylinders. An endless belt is driven across a bed of rollers by a motor and gear reducer, and the radial cylinders rotate by contact of the shoes on the belt surface.

In operation the heel of one shoe first comes in contact with the belt, and, as it travels along the sole and heel, both press on the belt surface. The load on the shoe gradually increases and is at a maximum when the piston is perpendicular to the belt surface. As the shoe travels farther the load gradually decreases; the heel leaves the belt, and the toe is flexed somewhat as in walking. The shoes are run against a cord rubber belt to minimize any wear on the soles since the test is primarily intended to show comparative endurance of the shoe upper leather, linings, stitches, and heels. Tests made on this machine check closely with those made on shoes in actual service.

Laboratory Mill Improvements

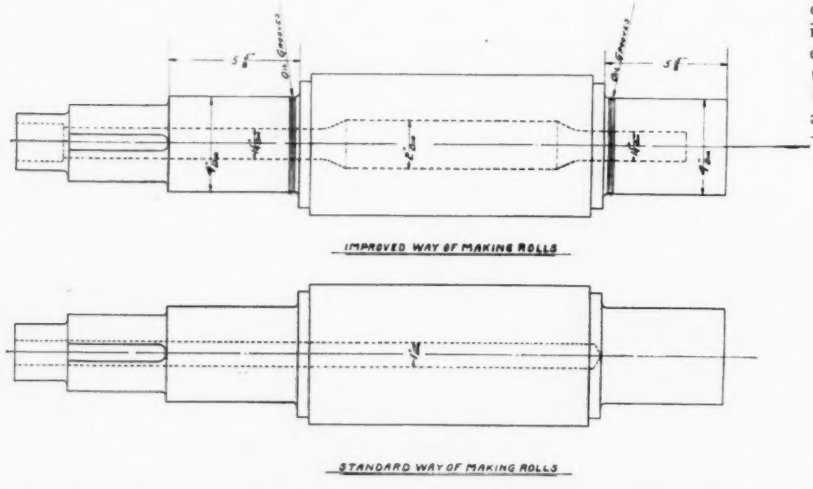
MANY new features of importance are included in the design of the 6- by 12-inch and the 6- by 16-inch laboratory mills manufactured by Wm. R. Thropp & Sons Co., Trenton, N. J. Fast and uniform changes can be effected in the temperature of rolls because of the hollow chambered interior allowing a greater volume of either steam or cooling water to be introduced, and at the same time the thickness of metal is reduced, thus making the transmission of heat or cold to the roll surface in a much shortened period of time. The 4-inch diameter roll necks, fitted to 5⅝-inch long bronze journals, are grooved to direct the flow of excess lubricant into troughs fastened to the frames, thereby preventing it from seeping under the automatically adjusted guides in order not to contaminate the mix.

Other features consist of front and back roll scrapers, removable mill pan, indicator adjustment screws, perfect guarding of cut-toothed, oil-dipped gears and stuffing boxes, a self-contained 5 h.p. motor with complete wiring magnetic switch, and safety attachments operating a solenoid brake that will meet the requirements of all state and insurance codes.

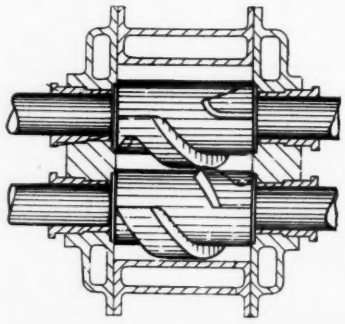
Rubber Mixer[1]

THE essential feature of the enclosed rubber mixing machine is the contour pattern on the roll surfaces indicated in the sketch. The machine comprises two rollers mounted in a casing and formed with raised spiral surfaces of comparatively large area and of any desired height, usually from a fifth to a sixth of the diameter of the body part of the roll. The spiral arrangement is such that the outer periphery of the raised portions in their passage across the body part of the adjacent rollers exerts a milling action on the plastic rubber mass; while the contour of the raised surfaces exerts an impelling action, causing the mass to traverse endwise and thus subjecting the gum to the repeated action of the rollers. Faster plasticizing is obtained as well as better compound distribution.

[1] U. S. patent No. 2,015,618, Sept. 24, 1935.



Improved Thropp Roll Design, Comparing the New Hollow Chamber Type with the Old Drilled Hole Type



Rubber Mixing Machine

Rubber Industry in America

OBITUARY

Albert F. Shore

ALBERT F. SHORE, inventor, metallurgical engineer, writer, and president of The Shore Instrument & Mfg. Co., Jamaica, N. Y., died January 17 at the age of fifty-nine of a stroke. His outstanding achievement was the invention of the Scleroscope, an instrument for measuring the hardness of metals, universally adopted throughout the world since 1907. He was awarded the Elliot-Cresson Medal from the Franklin Institute. He was a member of the American Society of Testing Materials, to which he contributed many papers on physical properties of metals. Mr. Shore leaves three brothers and four sisters.

Frank W. Kirk

FRANK W. KIRK, who for the past three years represented INDIA RUBBER WORLD in the Chicago territory, died at his home in Elgin, Ill., January 23, after a short illness. Mr. Kirk has spent his business life in the publishing field where he rendered energetic and conscientious service. For some years, during the period of the World War, he was associated with the American diplomatic staff in Paris. Funeral services were held January 25. He is survived by his wife, a son, and a daughter.

Will T. Cressler

WHILE vacationing in Florida, Will T. Cressler, for about fifty years owner of the Will T. Cressler Co., 536 Main St., Cincinnati, O., manufacturer of rubber stamps, died suddenly January 8. He also had been engaged in other business enterprises. Born in Iowa, Mr. Cressler came to Cincinnati more than a half century ago. His body was cremated at Daytona Beach on January 11.

Winfield S. Knowles

FOLLOWING a shock which terminated an illness of many years, Winfield S. Knowles, since 1915 president of Globe Rubber Works, Inc., 45 High St., Boston, Mass., died December 19. He had been in the grocery business until 1892 when he became associated with his brother in the mechanical rubber goods business as agents for the old United & Globe Rubber Co., Trenton, N. J. Mr. Knowles continued to operate the Globe Rubber Works as New England manager for Manhattan after the death of his brother in 1898. Then he incorporated the business in 1915, becoming its president.

His birthplace is Boston; his birthday, June 19, 1862; his schools, Quincy Grammar and Adams Academy.

Mr. Knowles was a charter member of Dorchester Lodge, a life member of Union Lodge, and a member of Mt. Vernon Chapter and St. Omer Comandry. He was also very active in church work.

Surviving are his wife, three sons, and a daughter.

Burial was at No. Eastham, Cape Cod, Mass.

Cecil S. Conover

A HEART attack, on January 1, caused the death of Cecil Sherman Conover, an executive of the I. B. Kleinert Rubber Co., 485 Fifth Ave., New York, N. Y., since August, 1927, when Kleinert bought the C. E. Conover Co., New York, for which the deceased had worked since June, 1900. He was secretary of the firm from 1911 to 1920; then he was made vice president and finally became president in 1925.

Mr. Conover was born in New York, February 16, 1880. He attended public school and Pingry School, Elizabeth, N. J., graduating from the latter in June, 1900, having taken a scientific course.

He belonged to the Holland Society, Jr. Order of the American Mechanics, and Notion Round Table. He was also an elder in the Dutch Reformed Church.

He leaves his wife, a son, a daughter, and a sister, all of Middletown, N. J.

Funeral services were conducted January 3.

Wm. H. Stradling

WILLIAM H. STRADLING, 72, police official of Morrisville, Pa., died January 7 after an illness of six months. For several years he had been a foreman for the Vulcanized Rubber Co., Morrisville, but retired some years ago to enter the police department. He was also a member of the Jr. Order United American Mechanics. Surviving are two sons and two daughters. Burial was in Morrisville Cemetery.

FINANCIAL[1]

Company Reports

Dayton Rubber Mfg. Co., Dayton, O. Year ended October 31: net profit, after taxes, interest, depreciation, and other charges, $49,565, equal to $1.06 a share on 46,518 shares of Class A stock, against net loss of $80,819 in the preceding year.

Lee Rubber & Tire Co., Conshohocken, Pa. Year ended October 31: net profit after expenses, interest, taxes, depreciation, and other charges, $184,586, equal to 72¢ a share on 254,465 shares of capital stock outstanding, compared with $326,870, or $1.28 a share, in the previous year. Year ended October 31: sales, $8,451,000, largest since 1930, an increase of more than 14% over the preceding fiscal year, when sales totaled $7,354,000.

National Rubber Machinery Co., Akron, O. Eight months ended August 31: net loss after depreciation, expenses, taxes, interest, and other charges, $24,285, according to figures reported to the New York Curb Exchange.

Seiberling Rubber Co., Akron, O. Year ended October 31: net loss, $9,761, compared with $546,689 loss in the preceding year.

Bond Redemption

United States Rubber Co., 1790 Broadway, New York, N. Y., through Treasurer Wilson H. Blackwell is calling for redemption on March 1, 1936, of its 6½% Serial Gold Notes, Series L, due March 1, 1937, at 101% of the principal amount thereof, and Series M, due March 1, 1938, at 102% of the principal amount thereof, together with accrued interest to March 1, 1936. Interest on these notes will cease March 1, 1936. Such notes must be presented March 1 for redemption and payment at the Guaranty Trust Co. of New York, 140 Broadway, New York, with the coupons maturing after such date. Coupons due on or before March 1, 1936, should be detached and presented for payment in the usual manner.

Cut in Capital Approved

Stockholders of the Anaconda Wire & Cable Co., at a special meeting in Wilmington, Del., on January 27 approved the reduction in capital to $16,898,800 from $20,270,718. The $3,371,918 will be transferred to paid-in surplus. Write-downs of $1,500,000 in normal metal, inventory and $1,016,296 in the value of certain obsolete buildings and equipment will be made and charged against surplus. When directors proposed the reduction, it was pointed out that dividend payments could not be made so long as inventory write-downs resulted in operating deficits. The company is controlled by the Anaconda Copper Mining Co., 125 Broadway, New York, N. Y.

[1] "Dividends Declared" on p. 86.

OHIO

INCREASED activity is apparent in most sections of the country, and confidence is being restored rapidly. The consensus of opinion seems to be that once the election is settled, the nation will make very rapid strides in 1937 unless the party in power continues to operate on a basis of mounting governmental deficits and increased regulation and regimentation of business. The feeling is general that the forthcoming national election will take a very conservative trend in character. Generally speaking, the outlook for improved business in 1936 unquestionably is splendid. While it is not expected that developments of boom proportions will occur, it is the consensus of opinion of business men in a large section of the country that very substantial increases, both in volume and in profits, may be expected in 1936.

Trade conditions in the tire industry very materially strengthened the last quarter. Prices have firmed up appreciably, and the outlook is considerably more cheerful, notwithstanding the fact that dealers' retail business on tires is fairly quiet. Sales to dealers are on about the same basis, however, as the preceding year, but manufacturers' sales are considerably greater so that the total volume of business is satisfactory.

The price level, while considerably firmer, is still 10% too low, but it is confidently expected that an upward revision in prices will occur not later than spring of from 5 to 10% that will materially improve the profit showing of the industry in 1936. A price increase now would mean little to manufacturers since tire business is seasonally at a low level.

There are several reasons why the tire industry feels it has chances for higher prices, the first and perhaps most important of which is the fact that the last price war was the worst in the history of the industry. After the underselling had progressed for some time branches and dealers actually got out of the hands of the sales departments of the companies and proceeded with the most drastic cut-throat methods. One case was reported of two branches of one company underselling each other in competition for a special account.

Another important reason for the outlook for higher tire prices lies in the higher prices for crude rubber that have prevailed the past two years. The larger companies by this time have used up at least a good portion of the really low priced inventories they accumulated during 1932 and which in some cases was charged down to lower than 3¢ a pound. Inventories now are probably close to the market of around 13¢ a pound so that the large producers will not have the leeway they had the past two years.

Tire production in Akron averages approximately 108,000 units a day, compared with about 80,000 units at the year-end period a year ago. Practically all factories are operating five and one half days a week, with some departments running six and seven days; the majority adhere to the six-hour day.

Besides their local operations the three major Akron companies—Goodyear, Firestone, and Goodrich—are producing a combined volume of more than 20,000 tires daily in their California plants; while Goodyear also is running on a high schedule at its Gadsden, Ala., factory.

Tire manufacturers anticipate production for 1936 will be greater than in 1935. While a slight decline in the replacement market is considered likely, the original equipment market is expected to take at least 2,000,000 more tires than in 1935. Unit tire sales in 1935 were the largest since 1931; while the tonnage of output was the largest in history. Tire shipments for 1935 increased about 6% over 1934 and amounted to nearly 50,000,000 casings, approximating the 1931 total of 50,060,000. Dollar value, however, was well under the 1931 figure.

Because of the large volume of original equipment business and of the benefits of diversification in other lines on the part of some interests, the aggregate profits of the leading tire manufacturers for 1935 probably registered a moderate improvement over 1934, when the four largest companies had combined profits of about $10,600,000. The combined results will be the best since 1929, but will be roughly 50% under that year. The major factor of earnings improvement over the early phase of the depression is the absence now of the heavy write-offs, particularly for inventory losses, which hit earnings severely in that period. Operating efficiency also has been improved.

In the manufacturing lines closely allied with the automobile industry a slight recession in orders was reported although the comparison with last year is still favorable generally.

Forecast for '36

"The year just closed should show increased sales and earnings in the rubber industry. Had it not been for the serious price wars on tires during the summer months, sales as well as earnings would be considerably higher. Fortunately these price wars are now largely eliminated, and with continued stability in the price of tires coupled with improvement in automobile production, as well as general business, we anticipate increased sales and better earnings in 1936." Thus spoke J. D. Tew, president, The B. F. Goodrich Co., Akron.

"As the year 1935 ends, conditions generally are much improved throughout the rubber industry, and all indications point to continued improvement in the months immediately ahead," W. O'Neil, president of the General Tire & Rubber Co., Akron, recently said. "With better times, more motorists are refusing to be satisfied with mediocre tires, just as they are dissatisfied with other mediocre merchandise. More are insisting on getting their money's worth for the dollars they spend."

Although chaotic price conditions prevailed in the tire market in 1935, quotations have become stabilized in the last thirty days, according to A. A. Garthwaite, vice president of the Lee Tire & Rubber Co., Conshohocken, Pa. This year, he said, should not only see an increased demand for tire and mechanical rubber goods, but prices should continue on a more even plane.

"The exhaustion in 1935," Mr. Garthwaite declared, "of inventories of tires made from low-cost rubber will be an important factor in firming the 1936 price level. In recent years some manufacturers have had the advantage of inventories of low-priced crude rubber accumulated in the years 1932 and 1933, when spot sold at 3.36¢ and 5.96¢ a pound respectively. Crude rubber in the last two years has been selling above 12¢ a pound, indicating the exhaustion of low-cost crude inventories."

Harvey S. Firestone, Sr., chairman of the board, Firestone Tire & Rubber Co., Akron, recently stated he saw "an end to the unsound and destructive merchandising policies which have cost the industry many millions of dollars." For the first time in many years, he said, the industry, its period of price cutting and similar practices apparently over, can hold up its head.

He added: "The business has never been in a better position to take advantage of the upward trend in the automotive industry and transportation.

"The rubber industry has just started to grow. Ahead is an almost untouched market. It is the furnishing of tires for 24,000,000 farm vehicles. The start has been made. Many tractors already are equipped with rubber tires. The future will see more of them. Shod with rubber, tractors can be built of lighter material and at lower cost."

Mr. Firestone awaits now for an expansion which he predicts will be "tremendous."

"Rubber is a great commodity and it will be much greater," he said. "It can't be otherwise."

John A. MacMillan, president, Dayton Rubber Co., Dayton, O., recently returned from a three-month business trip across the United States and touching South and Central America, announced:

"I find that general business conditions are so much on the upgrade that

there is little likelihood of any sustained dips in the business chart during the coming year. We may run into a few slackening periods, but these are likely to be short. . . .

"It is hardly necessary to again mention the fine outlook in the automobile industry. Five million cars in 1936 is the sales goal, which will be an all-time record. Electrical refrigerators and other household appliances will also enjoy big increases in sales. Manufacturers of machinery and the railroads will draw heavily on the suppliers of steel and other heavy goods industries. The construction of new homes and building is another basic industry that will contribute heavily to the 1936 march to prosperity. Increased business in these fields will very materially benefit our sales at Dayton Rubber. . . .

"Many new products will be marketed in 1936. Our engineers are working on several new developments, and it is possible that one or more will be perfected and ready to market before the end of 1936."

Julian W. Curtiss, chairman of the board, A. G. Spalding & Bros., Chicago, Ill., recently wrote: "For the first time since the beginning of the depression in the athletic goods industry, in the early Summer of 1931, it is now possible for the management to make the statement that in its best opinion our company has reached the turning point."

Firestone Tire & Rubber Co., Akron, recently conducted its annual sales conference attended by more than two hundred district and store managers and their assistants. A highlight of the meeting was a demonstration of pneumatic tires on farm equipment.

On December 20 Harvey S. Firestone, Sr., chairman of the board, celebrated his sixty-seventh birthday. At a banquet attended by executives of the Firestone organization in honor of the occasion Mr. Firestone was presented with a beautiful crystal and silver vase on a marble base. John F. Ward, manager of the Kansas City district, offered the gift on behalf of the guests. Mr. Firestone now is spending the winter at his Miami Beach, Fla., estate.

The annual Christmas party for the children of Firestone employes was an outstanding event of the year. The gala entertainment included a show, moving pictures, music, Santa Claus, and presents.

Carbon Black Agent

The Imperial Oil & Gas Products Co., Pittsburgh, Pa., has appointed Hugh S. Stoller, 31 N. Summit St., Akron, agent for the sale of its carbon blacks to the rubber industry in Ohio. Mr. Stoller has long been associated with the rubber industry. From 1928 to 1934 he was with The General Tire & Rubber Co., Akron. At first he worked in every department relating to tire building. After two months in the factory he was put on special sales work in Ohio, Michigan, Indiana, and Kentucky. His last three years with General were spent on commercial and retail sales in company stores. From 1934 to 1936 Mr. Stoller was secretary and consultant for United Laboratories, Cleveland. Two years prior to joining General he sold Toledo scales in Tulsa, Okla.

Hugh S. Stoller

Mr. Stoller, who was born in Galion, O., July 23, 1905, attended local grade and high schools. He belongs to Adoniram Masonic Lodge, Akron.

Goodyear Notes

The Goodyear Tire & Rubber Co., Akron, has announced that its total payroll for November and December, 1935, was $800,000 larger than for the same two months of 1934. The company's employment is now 16,000, an increase of 4,100 over the 1932 low and 800 above Goodyear's ten-year average employment.

Sears Roebuck Case

After exactly two years of attempting to prove that Goodyear discriminated against its own dealers in tire sales in favor of Sears Roebuck & Co., Chicago, Ill., the Federal Trade Commission, Washington, D. C., on January 15 closed hearings in the case and began consideration of the voluminous evidence. A decision is expected this month.

Working Hour Controversy

Goodyear is seeking unjustified lengthening of working hours and reduction in wages, according to the fact-finding board appointed by Secretary of Labor Frances Perkins. The board maintained Goodyear had violated its agreement of April 13, 1935, to negotiate with its employes.

The board held that in the controversy concerning hours, wages, and lay-offs the Goodyear management "did not enter fairly into negotiations with employes or with any of their representatives, but rather promulgated a policy and then sought endorsement by representatives of employes, or, in effect, merely gave notice concerning such policy."

The board held against the company in its attempt to extend the six-hour day to eight hours. It found no justification for such a procedure, as the company had of its own volition established the shorter work day.

The report pointed out that, after two years of operation, the company reported that the six-hour day had resulted in an increase of 8% in efficiency and had not noticeably increased overhead costs.

Starting January 13 most of the tire divisions of Goodyear's Plant 2 went back to the six-hour shift. The reason given was "a change in the production ticket following seasonal tire demand." The company denied that the above mentioned report had anything to do with its change in hours, saying it was adhering to its policy of regulating production by the flow of business.

Sales Policy

The company will sacrifice volume of business in 1936 if necessary to obtain profitable operations. Two main objectives were outlined by President P. W. Litchfield—first, to operate at a reasonable profit, and, second, to maintain or increase volume so long as this contributes to the first objective.

The statement by Mr. Litchfield, in the Goodyear *Triangle,* published for its sales force, gives every indication that the company will do all in its power to eliminate erratic tire price movements which prevailed during 1935, and that, in particular, it will try to eliminate the road hazard guarantee.

This guarantee, introduced by Standard Oil companies when they marketed the Atlas tires, is estimated to have cost the industry $7,000,000 in 1935 and that it would amount to $10,000,000 in 1936. While it is impossible to estimate the cost of the price war of last year, it was probably even more expensive to the industry than the guarantee.

Cocktail Lounge a la Rubber

In casting around for a decorative theme for its new cocktail lounge the management of the Portage Hotel, Akron, O., reasoned that since rubber is the backbone of their city's industrial life, it was decidedly worthy of recognition. As a result, Architect Kenneth C. Welch, Grand Rapids, Mich., was commissioned to draw up plans for the "Rubber Room." Invitations, printed on rubber, were issued for the informal opening December 21. The hundreds of guests who attended were not only impressed with the beauty of this room, but marveled at the many uses for which rubber had been adapted.

All doors are rubber covered; the floors are of rubber tile; stools, chairs, and settees are all upholstered and covered with rubber materials; wains-

coting and mural decorations are constructed entirely of rubber; your drinks are mixed at a rubber bar and placed before you on rubber topped tables.

The wall decorations consist of six life-size murals, done completely in rubber, which depict important events in the early years of the industry and scenes from the plantation and factory. This work is believed the first attempt to create murals from rubber. Thousands of pieces of rubber in eleven different colors were used to construct these scenes from the original drawings prepared by Ivor Johns, Cleveland mural artist. With the aid of indirect lighting, most striking color effects are obtained.

The central lighting fixtures consist of six automobile tires, mounted on disk wheels, suspended from the ceiling. Each tire represents one of the six major tire manufacturers in the Akron district.

Through the use of Goodrich rubber tile a colorful and unique floor design has been obtained by inlaying a series of figures which represent the various products of the rubber industry, such as a boot, transmission drive, and hot water bottle.

The settees, chairs, and bar stools are all upholstered with Nukraft, a new Goodrich product consisting of a hair cloth, insulated with latex, which is fabricated into a series of small figure-eight springs. The Nukraft is in turn covered with a rubber fabric resembling brown suede supplied by the Hood Rubber Products Co.

Architect Welch has also added another distinctive touch by capping the rubber wainscoting around the room with a green molding made from half-sections of Goodrich Garden Club Hose.

Although the "Rubber Room" was designed primarily for novelty appeal, it incorporates many practical and worthwhile features which the industry may well capitalize on.

A Section of the Novel "Rubber Room" at the Portage Hotel

Tire Sales Manager

His long experience well qualifies Willis C. Behoteguy for the important position he holds as manager of automobile tire sales, The B. F. Goodrich Co., Akron, O., being responsible for sales of Goodrich passenger car tires and tubes. Mr. Behoteguy began his career in rubber in 1912 when he joined the Goodyear Tire & Rubber Co., Akron, where he remained until 1928, having held several posts including managerships of the manufacturers sales department, of the automobile tire department, and of tire sales. He next served the Miller Rubber Co., Akron, as manager of tire sales until 1930. Then he went to the Goodrich company in his present position. During the life of NRA, Mr. Behoteguy was also an alternate on the trade practice complaints committee established under the code for the rubber tire manufacturing industry.

This executive was born in Emporia, Kan., in 1890. He attended Wooster preparatory school and college, graduating from the latter in 1912 with the degree of Ph.B.

Goodrich Activities

C. W. Wacker was appointed western representative on National Account sales, with headquarters in Chicago, according to G. E. Brunner, manager of Factory Account sales of The B. F. Goodrich Co., Akron, O. Mr. Wacker was formerly assistant to the manager in the company's Group Buying and Selling organization. In his new post he succeeds H. C. Krimmel, transferred to the Manufacturers' Sales Division.

Mr. Brunner also announced the appointment of R. E. Hower as Pacific Coast representative on National Account sales. In addition to his new duties Mr. Hower will continue to handle Special Account sales on the Pacific Coast.

W. C. Behoteguy

Winners of a recent national contest among Goodrich salesmen and retail store managers for unusual facts concerning usage of the company's truck tires follow: J. C. Clendenin, salesman, Tulsa Rubber Products Co., Tulsa, Okla., first prize; S. W. Carson, manager, Goodrich Silvertown Store, Steubenville, O., second prize; L. P. Reuland, wholesale salesman, Los Angeles district, third prize; and ten other cash prizes to:

J. B. Benson, Staunton, Va.; L. R. Wilson, Colorado Springs, Colo.; A. E. Allen, Sacramento, Calif.; Manley L. Brown, Charlotte, N. C.; Walter F. Wheeler, Poughkeepsie, N. Y.; E. W. Poinier, Boston, Mass.; Carl F. Helgren, Omaha, Neb.; L. G. Hansen, Denver, Colo.; G. G. Doering, Atlanta, Ga.; and Sam B. Smith, Aberdeen, Wash.

At the largest ceremonial yet held by the Goodrich Twenty-Year Service Club in December, J. D. Tew, Goodrich president, presented twenty-year service emblems to one hundred and two men and women. Ten others in the same class were unable to attend. Addition of this latest group to the club boosts its membership to more than 1,300. Among those who received their pins at this ceremonial were A. C. Kelly, Chicago district manager; Walter F. Geissel, Des Moines district manager; and C. G. Morgan, Buffalo district mechanical division manager.

Mrs. Illa N. Kirn, last active Goodrich employe who was a member of the organization during the days of Dr. Benjamin F. Goodrich, the company founder, retired from active service in December. She celebrated her sixty-fifth birthday at work. Mrs. Kirn first joined the Goodrich company in April, 1888. She was with the organization until 1902, returned in 1909, and had been in continuous service for twenty-six years since. For many years

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EASTERN AND SOUTHERN

IN THE East and South business, in general, seems gaining. New construction featured activity in the heavy industries. The steel industry, however, dropped a little.

Clothing and textile plants continue active, with sufficient orders to insure operations the rest of the season. The year just closed was the best one in a long time. But orders for staple cottons were still limited as a result of the uncertainty created by the Supreme Court decision on the AAA.

Machine tool orders in December were about the same as in the two preceding months, and the gain in dollar sales for the year, compared with 1934, was 85%.

Numerous industrial plants of various kinds in the Philadelphia district were sold at auction last month to clear up old financial difficulties, and conditions in central real estate are being readjusted to meet requirements of improving trade and renewed activity in the wholesale and jobbing sections.

Down South the gain in business is widespread, but is more evident in the cities and in those sections where the cotton crop was recently marketed.

The recent increase in the price of crude oil has heartened the petroleum industry in Texas. Much drilling is under way, not only in proven fields yet undeveloped, but in wildcat areas.

Predictions are being made by many conservative business men of a phenomenal year in business throughout the Southwest, and merchants are planning accordingly. Much new building and store improvement are contemplated, and retailers are preparing to lay in the largest stocks in several years.

A recent survey of the earnings of leading companies in various industries which in most instances showed increases reflecting the improved business conditions throughout the country that started early in 1935, included the two following statements:

A somewhat irregular trend in the rubber field is evidenced by the figures of the leading companies. Although manufacturers of general goods showed indications of better business, tire makers were handicapped by the instability of price structure and competitive conditions throughout the trade. Sales of tires, however, continued to grow with automobiles produced.

The rise of activity in chemicals during the first three quarters of last year over the same time in 1934 was attributed principally to the increased demand here and abroad for chemicals.

E. I. du Pont de Nemours & Co., Inc., Wilmington, Del., will erect a thirteen-story office building in Wilmington to relieve congestion in the present building and to provide for future expansion.

Blackstone Studios

Floyd Y. Keeler

Commodity Exchange Elections

Members of the Commodity Exchange, Inc., 81 Broad St., New York, N. Y., at their annual election January 21 chose four new governors and reelected four retiring ones. Except Charles S. Walton, Jr., a new governor, elected for one year, all governors were elected for three-year terms. The other new governors are George B. Bernheim, Harry A. Astlett, and Alexander D. Walker.

On January 23 at its meeting the board of governors elected the following officers of the Commodity Exchange to serve during 1936: President, Floyd Yates Keeler, of Orvis Bros. & Co., to succeed Jerome Lewine, of H. Hentz & Co. Vice Presidents, Douglas Walker, of Douglas Walker & Co., to succeed Charles Muller; E. L. McKendrew, of Armand Schmoll, Inc., reelected; Ivan Reitler, of Federated Metals Corp., reelected; J. Chester Cuppia, of E. A. Pierce & Co., reelected; William E. Bruyn, of Littlejohn & Co., Inc., to succeed Charles Slaughter of Slaughter, Horne & Co. Treasurer, Martin H. Wehncke, of Brandeis, Goldschmidt & Co., Ltd., to succeed Mr. Keeler.

The new president has had a varied career. Following graduation from Columbia College (A.B.) in 1906, he spent two years at practical farming. In 1908 Mr. Keeler joined Dr. Lyon's Tooth Powder Co., of which he subsequently became vice president in charge of advertising and sales, a position he resigned to join Frank Seaman, Inc., from which vice presidency he resigned March 1, 1924, to enter the brokerage business of Orvis Bros. & Co., of which he is now a senior partner.

When in the advertising business he wrote numerous articles for the trade press, was a vice president of the Advertising Club of New York, and chairman of the executive committee of the Association of National Advertisers.

During the World War Mr. Keeler served on the Morale Branch of the General Staff in Washington, D. C. First he was a first lieutenant, then a captain, and until recently a major in the Reserve Corps.

At present Mr. Keeler is also president and director, Commodity Exchange Hide Clearing Association; vice president and director, Commodity Exchange Silk Clearing Association; director, Commodity Exchange Metal Clearing Association; director and member of executive committee, American Hide & Leather Co.; member of New York Cocoa Exchange, Inc., New York Curb Exchange, Canadian Commodity Exchange, and Chicago Board of Trade; and president and director, Forty Fifth Ave. Corp. A social registerite, Mr. Keeler belongs to many clubs, including the Society of Founders Patriots; Sons of the American Revolution; and University, Columbia University, Richmond, Country, Silver Spring Country, Army and Navy, and Downtown Athletic clubs. He is also warden and treasurer of St. James Protestant Episcopal Church, North Salem, N. Y., where his family homestead is.

The Society of Chemical Industry, American Section, will meet February 21 at 7:45 p.m., at The Chemists' Club, 52 E. 41st St., New York, N. Y. Robert J. Moore will preside over the meeting at which E. R. Bridgwater, manager of the Rubber Chemicals Division of E. I. du Pont de Nemours & Co., Inc., Wilmington, Del., is to be the guest speaker. His paper is entitled "Economics of Synthetic Rubber." A dinner will precede the meeting, starting at 6:15 p.m.

A. J. Kaminsky, sales manager of the Carlyle Rubber Co., Inc., mechanical rubber goods house, 64 Park Place, New York, N. Y., was married on January 12 to Miss Beatrice Rich. The couple went on a four-week southern cruise honeymoon.

The Seventh Annual Greater New York Safety Conference will be held at the Astor Hotel, March 3, 4, and 5. Thirty-three complete half-day sessions will cover the entire field of accident prevention—in industry, on streets and highways, in the home, and in the air. The Conference Committee anticipates an attendance of not less than 6,000. All sessions are open to the public without any cost whatsoever. Programs and registration blanks will be sent on request to the Conference Headquarters, 9 E. 41st St., New York, N. Y. W. Graham Cole is chairman of the publicity committee.

Greetings, Calendars, and Souvenirs

The staff of India Rubber World gratefully acknowledges the following holiday mementos.

From Godfrey L. Cabot, Inc., Boston, Mass., came a swanky individual desk lighter.

Useful and interesting pocket memorandum books were sent by General Electric Co., Schenectady, N. Y., and John Royle & Sons, Paterson, N. J.

The General Tire & Rubber Co., Akron, O., gave a neat wallet.

A very practical combination fountain pen and pencil came from H. Muehlstein & Co., Inc., 122 E. 42nd St., New York, N. Y.

Good looking cards bearing holiday greetings were sent by Binney & Smith Co., 41 E. 42nd St., New York; The Cleveland Liner & Mfg. Co., Cleveland, O.; Davol Rubber Co., Providence, R. I.; General Atlas Carbon Co., 60 Wall St., New York; Robert E. Powers, of The B. F. Goodrich Co., Akron; H. H. Heinrich, of H. H. Heinrich, Inc., 200 Varick St., New York; J. R. Coe, of Naugatuck Chemical, Naugatuck, Conn.; Joseph Rossman; C. S. Ching, of United States Rubber Co., 1790 Broadway, New York; and W. W. Higgins, of United Carbon Co., 350 Fifth Ave., New York.

Attractive calendars were forwarded by General Electric Co.; Heveatex Corp., Melrose, Mass.; Imperial Color Works, Inc., Glen Falls, N. Y.; Link-Belt Co., 2045 W. Hunting Pk. Ave., Philadelphia, Pa.; National Rubber Machinery Co., Akron; Northwestern Rubber Co., Litherland, Liverpool, England; The Oak Rubber Co., Ravenna, O.; Westinghouse Electric & Mfg. Co., E. Pittsburgh, Pa.; and C. K. Williams & Co., Easton, Pa.

United States Rubber Co., 1790 Broadway, New York, N. Y., received a rebate of $2,200 by the Town Council of Bristol, R. I., as a result of a protest against the 1935 tax levied by the Bristol tax assessors. The rebate was based on a reduction of $100,000 on the assessed valuation of the company's property. This is the second time within four years that the company has been awarded a rebate.

Samuel Leavy, for three years New York representative of the Elm City Rubber Co., 175 Fifth Ave., New York, N. Y., and for eleven years prior to that connection sales representative for other concerns, has established his own business as the Horace Rubber Products Co., 39 E. 19th St., New York. This new firm will carry a full line of bathing caps and accessories, sheetings, baby pants, aprons, etc.

National Association of Waste Material Dealers, Inc., will hold its twenty-third annual convention at the Hotel Astor, New York, N. Y., March 16 to 18, inclusive. It promises to approach, if not surpass, both in attendance and interest, conventions of that association held during the most prosperous years which followed the World War.

Carl L. Reed

Export Manager

The appointment of Carl L. Reed as manager of the export department of The Kelly-Springfield Tire Co., 405 Lexington Ave., New York, N. Y., was announced recently by President E. S. Burke. Mr. Reed for the past eight years represented the Fisk Rubber Co., Chicopee Falls, Mass., as manager of its Brazil office and brings to his new post a background of practical tire selling experience in the Spanish-speaking countries which dates to his first position as a retail tire salesman in 1912. Mr. Reed was for four years a distributer and importer of tires and allied products in Puerto Rico. He later covered the Caribbean territory as sales representative for the Miller Rubber Co., Akron, O. He then represented Miller as manager of the Pittsburgh and Philadelphia offices before joining Fisk.

He is the author of the only known book in Portuguese on credits, published last year in Brazil.

In announcing this appointment, President Burke declared that Kelly-Springfield's export business has always contributed a large and stable volume to the company's total sales. With the intimate knowledge of South American markets possessed by Mr. Reed, an intensive campaign will be inaugurated further to develop this field for the sale of Cumberland-made Armorubber Tread tires.

General Dyestuff Corp., 230 Fifth Ave., New York, N. Y., recently leased a Hudson St., New York, blockfront, comprising 27,000 square feet, for the construction of a nine-story building to house offices, laboratories, and storage and shipping facilities. The total investment will be about $3,500,000, and the lease covers twenty-one years. General Dyestuff, to occupy the entire structure, is sales agency for the General Aniline Works, Inc., 1150 Broadway, New York, a subsidiary of the American I. G. Chemical Corp., 521 Fifth Ave., New York.

Ohio

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previous to her retirement on pension she had been secretary to A. C. Sprague, employment manager.

Silvertown Stores Appointments

C. P. St. Clair is new credit manager for the Detroit district, according to F. O. Slutz, Detroit district manager for the company.

Mr. St. Clair joined Goodrich in 1928 and previous to his present appointment had been on the credit staff of the Detroit district. He succeeds D. B. Hosman, appointed sales supervisor in this district.

Several other appointments in the Goodrich Silvertown Stores, retail organization of the company, have been announced by J. A. Hoban, manager of retail sales. Managers: J. S. Bates, 2325 Grand River Ave., W.; and M. E. Weislow, 17535 John R St., both of Detroit; J. McK. Duncan, Cass Ave. and W. Lawrence St., Pontiac; T. K. Jentes, 726 Huron Ave., Port Huron; S. E. Gunderson, Columbus Ave. and Lake St., Minneapolis; F. E. Walker, Second and Farland Sts., Flint; H. S. Payne, Park and Fifth Sts., Fremont; Frank Stevens, 260 Central Ave., Albany.

Credit and Operating Managers: W. L. France, 604 Belle Ave., Alton; R. G. Tiffin, Tuscarawas St. W. and Shorb Ave., Canton; G. Brandy, 225 Broad St., Elyria; E. Welsh, Main and Washington Sts., Ocala.

New Tire

Goodrich recently announced a new line of tires for half-ton and 1½-ton trucks in city delivery service. Known as the "Store-Door" Silvertown, the new tire is specially designed for milk routes, grocery delivery, ice and coal trucks, florists, laundries, dry cleaners, department stores, public utilities, municipal waterworks, and all other types of delivery service which call for a large number of stops and starts by the truck.

The new tire sizes range from the one with a carrying capacity of 1,050 pounds to one having a carrying capacity of 2,200 pounds. Sizes are 6.00-16; 5.25-17; 5.50-17; 5.25-18; 5.50-18; 30 by 5; 6.50-20; 32 by 6; 7.00-20 and 7.50-20. Average weight of the tread on each tire is 47% greater than that of a comparable size ordinary tire; the tread design depth and tread width average 30% greater, and the actual rubber contact area with the pavement 42% greater.

Developed to meet a demand for a product which will give longer wear where frequent starts and stops are made in city delivery work, the new tire, it is claimed by the manufacturer, will save thousands of dollars annually for operators whose service demands many "store-door" deliveries. Ruggedness of the tire, with the extra thickness that will prevent many ordinary punc-

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NEW ENGLAND

GENERAL industrial conditions in New England remain practically unchanged from December. Reports from a wide variety of manufacturing companies covering many different industries indicate that operations are at practically the same rate as a month ago. The cotton end of the textile business, however, is still slack. Shoe manufacturers gradually are expanding operations.

Rubber goods factories in Rhode Island at present are experiencing a seasonal lull in manufacturing activities; plant operations are about the same as during the corresponding period a year ago. In view of the unusually active operations during the final months of 1935, however, manufacturers are rather encouraged by present conditions and the immediate outlook.

Close watch is being kept on the influence of the recent Supreme Court decision relative to the AAA. Those departments in the rubber industry which use cotton in their products stand to benefit by the ruling that outlawed the AAA, it is said, since much of the cotton the rubber plants purchased the past few months has been bought with the understanding that money paid to cover processing taxes will be refunded. Manufacturers are not too certain they will ever receive any of the money paid to the government, but they look forward to repayment of funds now held in escrow.

The general rubber goods division tends toward spottiness with the manufacture of rubberized thread at subnormal levels. But manufacturers are not discouraged because volume in the latter months of 1935 was so heavy as to indicate that the users of this product was stocking themselves ahead; so a delay in the usual January pickup is termed a logical development. Thus present production of rubber thread is far below that of a year ago, but the rate in December was much more active, and the total output for the past five months has greatly exceeded that in the similar period a year ago.

Plant activity in druggists' sundries changed little the past few weeks; while employment and payrolls are virtually stationary. But collections are continuing good. In the industrial tank lining division operations continue steady. One large order recently received has made Saturday operations necessary in scattered departments, but the tank lining and the rubber roll-covering section, as a whole, is about maintaining its pace. At present factories are busy with golf balls, swim suits, beach novelties, and other sport articles for the summer season. Executives hope sports goods sales will reach larger proportions this year than they did a year ago when unfavorable weather conditions shortened the season with unsettling effect on all divisions. Manufacturers, wholesalers, and retailers had stocked up well in anticipation of a brisk selling period; but when warm temperatures failed to arrive on schedule, there was a general movement to reduce stocks through promotion sales. Predicted reorganizations in distributive divisions of the industry have yet failed to develop, but it is pointed out that wholesale and retail houses have not yet had sufficient time to study their inventory positions. The feeling here is that necessary financial readjustments will be found mostly among smaller organizations.

Anent conditions at the close of 1935, statistics concerning December business activities are interesting. Activity in Rhode Island's leading industries for December established a five-year high for the month for power consumption which averaged 9.4% higher than in November and 15.4% advance over December, 1934. The relatively largest upturns took place in the metal and rubber trades. The latter consumed 1,486,038 kilowatt hours of electric power, against 1,128,441 kilowatt hours in December, 1934, a 31.7% increase. Comparing 1935 with 1934, the electric power used in the rubber industry was 15,426,563 kilowatt hours against 14,649,842, a 5.3% increase.

Payrolls of Rhode Island manufacturing establishments totaled $8,923,182 in December, according to the Brown Business Research Bureau, a gain of 8% over those of December, 1934, but 5.3% less than in November, 1935. The decline, however, was largely seasonal, it was pointed out. Only one industry showed a November-December increase, rubber goods, with a rise of 4.9%. This industry's payroll in December, 1935, at $235,606, was 13.5% greater than that of December, 1934.

Norman Arthur Shepard

Monsanto Chemical Co., St. Louis, Mo., has announced the election of William M. Rand as president of its subsidiary, Merrimac Chemical Co., Everett, Mass., succeeding Charles Belknap, who recently moved to St. Louis as executive vice president of Monsanto. Mr. Rand joined Merrimac in 1919 and was vice president in charge of sales since 1923. He is also a director of Monsanto Chemical Co.

The Washburn Wire Co. is erecting an all-metal building at its plant on Bourne Ave., East Providence, R. I., to house the shipping department, to be 72 by 280 feet and cost about $8,000.

Amory Coolidge, vice president, Pepperell Mfg. Co., is a director of Old Colony Trust Co., Boston, Mass.

Phillips-Baker Rubber Co., 44 Warren St., Providence, R. I., is making alterations at its plant. The work includes removal of the present wooden columns and substitution of steel beams and columns.

Middletown Rubber Co., Middletown, Conn., is erecting extensions to its plant to accommodate additional equipment for the rapidly increasing requirements of rubberized fabrics and artificial leather that are produced by this concern.

The Fisk Tire Co., Inc., Chicopee Falls, Mass., which discontinued its branch in Columbus, O., in 1931, will reopen a direct factory branch there at 214 Neilston St., to serve central Ohio and West Virginia. A complete line of Fisk and Federal tires, repair material, rubber accessories and golf balls, for the dealer trade, will be carried. Emil Ruppel has been appointed zone manager for this district, and Fleming Wall will be the local office and credit manager.

Dr. Norman A. Shepard has been appointed director of technical service for the American Cyanamid Co., 30 Rockefeller Plaza, New York, N. Y., the American Cyanamid & Chemical Corp., and other companies in the Cyanamid group where cooperation in this field is required. He will be responsible for directing the technical service laboratories located in Stamford, Conn., the expansion of the sales service laboratories to meet present and increasing need and the co-ordination of the technical and sales service work in all of the several divisions of the above named companies. Dr. Shepard has been director of the research laboratories of the Firestone Tire & Rubber Co., Akron, O., from 1919 to date. He will begin his work with the Cyanamid group about February 15 and will have his headquarters at the Stamford Laboratory.

NEW JERSEY

RUBBER manufacturers of New Jersey believe that business conditions will improve more and become more settled after the United States Supreme Court has finally disposed of all the regulatory measures put into effect by the administration the past few years. Most factories are fairly busy, and some have orders booked ahead. Tire companies find conditions holding up well; while boot and shoe manufacturers are enjoying a greater demand for their goods. The reclaiming trade, judging from orders received by makers of scrap cutters and tire choppers, seems very slow. But manufacturers of molded rubber goods enjoyed the best December business in their history, despite the fact that some lines usually drop off during December. January opened up very well, and prospects for 1936 are much better than they were for 1935.

In the face of the Social Security payroll tax and other tax increases prices of rubber goods must either advance or some rubber companies will face trouble. There are no accumulations of stocks in the country, and if factories took a sane view of merchandising, a good profit would result for all concerned. No one will relinquish a close connection; and if those concerned realized this fact, price cutting would be eliminated, and satisfactory profits mutually accrue.

The Rubber Manufacturers' Association of New Jersey at its annual meeting at the Trenton Club, Trenton, December 19, reelected the following officers: president, John A. Lambert, of the Acme Rubber Mfg. Co.; vice president, Lloyd R. Leaver, Hamilton Rubber Mfg. Co.; secretary, Charles E. Stokes, Jr., Home Rubber Co.; treasurer, Horace B. Tobin, Woven Steel Hose & Rubber Co.

American Hard Rubber Co., Butler, on January 24 and 25 sponsored its second annual hobby show open to all. John L. Grider handled arrangements, and many awards were made.

Passaic Rubber Co., Clifton, is manufacturing 100,000 rolls of a special rubberized tape to be used in the construction of the bridge across the Golden Gate, entrance to San Francisco Bay. The company also makes tape for the United States Navy as well as truss pads, rubber bottles to give horses medicine, and brake linings for machinery. Henry C. Mathey is president, and J. W. Partington vice president of the concern. Ten men are employed in the factory.

The Pocono Co., Trenton, finds business improving. Comptroller Karl L. Genz was made a full-fledged "Kentucky Colonel" at a recent gathering of Pocono employes. The commission of colonel was sent by J. Edgar Rogers, of Louisville, Ky., an aide-de-camp on the staff of the Governor of Kentucky.

Thiokol Luncheon

Bevis Longstreth, president and general manager, Thiokol Corp., Yardville, N. J., spoke concerning the important characteristics and widespread applications of the new synthetic rubber, Thiokol, at a luncheon meeting of over one hundred guest chemists and engineers representing various industries at the Biltmore Hotel, January 27. He drew attention to the fact that the improvement of tires to yield 20,000 or more miles of service from the 2,000 miles of a few years ago has not been due to the discovery of new and superior grades of natural rubber, but to the efforts of chemists in finding new rubber compounding ingredients and the more effective methods of using those long known. Likewise in the development of synthetic rubber chemists have discovered means of accomplishing desirable practical advantages such as resistance to oils, normal rubber solvents, oxygen, ozone, corona effects, etc., to a degree not possible with the natural product.

"The cost of synthetic rubber," Mr. Longstreth said, "will perhaps never become as low as that of crude rubber today, but this difference is offset in many applications by the value of characteristics possible here but unattainable with crude rubber and in others by manufacturing articles directly without the long sequence of expensive preparatory operations such as mixing, calendering, tubing, etc."

Reference in this instance was made particularly to the molding powder form of Thiokol. Another interesting sidelight, according to this speaker, is the fact that in case of a national emergency, eliminating rubber imports, the United States could be assured of an adequate supply of synthetics sufficient for all rubber product needs since all component materials are abundantly reposed in our own natural resources.

Dr. C. E. Reid, professor of organic chemistry of Johns Hopkins University, spoke of the universal importance to life and industry of sulphur, its derivitives, and its complicated but reactive chemical forms. He also paid high tribute to Joseph C. Patrick, Ph.D., discoverer of these sulphur compound synthetics, and vice president and technical director of Thiokol Corp.

Dr. Patrick reviewed briefly the history of his researches which began several years ago in Kansas City as the result of an experimental anti-freeze failure producing a resilient gum-like mass instead of the desired low temperature solution. He led a vivid demonstration by having each guest conduct a simple experiment with solutions provided to coagulate Thiokol gum from a sodium polysulphide-ethylene dichloride solution—artificial latex—with dilute hydrochloric acid, thus simulating in effect the coagulation of rubber from natural latex.

Other speakers were J. E. Frey, printing division, Standard Register Co., Dayton, O., who revealed the rapid advancement that has been made possible in printing plates because of Thiokol powder; C. Kenyon, president, Vulcan Proofing Co., Brooklyn, N. Y., who attributed the most remarkable recent advancement of off-set printing blanket application, adopted by 1,500 newspapers in the United States, including all but one in New York, to the use of this synthetic; Donald Simmons, chief constructional engineer, General Cable Corp., 420 Lexington Ave., New York, who explained the unique value of Thiokol in certain types of insulations and protective sheaths; and Sidney Kirkpatrick, editor of *Chemical & Metallurgical Engineering.*

At each plate was a copy of the new booklet, "A Rubber Plantation in New Jersey," with the compliments of the host. Herein is set forth the terse but comprehensive and interesting story of synthetic rubber, its history, its source, its characteristics, and its important and romantic applications extending the field of rubber beyond the reach of rubber itself.

Jos. Stokes Rubber Co., Trenton, continues to operate twenty-four hours a day. Milton H. Martindell, vice president and treasurer, was on a business trip to the West Coast and to the company's plant in Canada.

President Wm. J. B. Stokes, who died December 15, in his will provided bequests to charity exceeding $40,000. Besides $100,000 is set aside in specific bequests for grandchildren in addition to provisions for other members of his family. Mr. Stokes also gave $15,000 to the Carolyn Stokes Day Nursery, named after his deceased daughter. He left his home in Trenton, another in Princeton, and his automobiles to his widow. The sum of $17,500 is divided between three Trenton hospitals, and $10,000 goes to the State Street M. E. Church, of which he was a trustee.

Nearpara Rubber Co., Trenton, reports a good demand for reclaimed rubber. President Benjamin M. Rosenthal, ill for several weeks, has gone to Florida to recuperate.

Hamilton Rubber Mfg. Co., Trenton, through A. Boyd Cornell, treasurer and general manager, has announced that Lloyd R. Leaver, recently resigned as vice president of the mechanical rubber goods division of The Thermoid Co., Trenton, has joined the Hamilton sales organization as an executive sales assistant with headquarters in the factory at Trenton. H. T. Cook is Hamilton president, and H. N. Young, vice president.

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MIDWEST

GENERAL business conditions in the Midwest appear much better than a year ago. The feeling is that the first half of 1936 will maintain the average for the latter part of 1935 and probably exceed it.

Interest recently has been centered, of course, on the Supreme Court's decision invalidating the AAA. So far mail order houses report no decline in sales because of this decision. Farm implement sales also are gaining. Wholesalers, however, are receiving spotty orders, due to some uneasiness over the AAA abrogation and falling off of relief aids in rural centers.

Several large plants have announced extension plans, and, while large industries continue to lag slightly, it is believed that rail and other orders will soon be forthcoming.

Shoe plants in small towns have picked up, and the operating ratio of most of them is around 85%.

Manufacturers of rubber machinery report the demand for their product about the same as for the past year.

Automobile production was resumed at the rate in effect prior to the holiday period, and schedules indicated a January output close to the December figure, 410,000, compared with 398,000 in November.

There is less than normal amount of rubber footwear on dealers' shelves, the result being that any small snow or storm results in an immediate dealer demand for rush shipments from the manufacturer.

Zinc and lead prices continue steady.

Motor & Equipment Wholesalers Assn., 400 W. Madison St., Chicago, Ill., recently ended its most successful convention at Atlantic City. One of the outstanding speakers was J. P. Seiberling, general sales manager of the Seiberling Rubber Co., Akron, O., who discussed "Safeguarding Independent Business." His appeal to an appreciative jobber audience sounded the keynote for the entire convention. The report of the association's Petroleum Industry Activities' Committee was presented by Elton R. Seager, Pennsylvania Rubber & Supply Co., Cleveland, O., a member of the committee.

Milne Studios, Ltd.

J. P. Seiberling

Baldwin Rubber Co., Pontiac, Mich., recently entertained children of its employes at a most enjoyable and well attended Christmas party.

Prof. F. L. Bennett, of the Spearfish, S. D., Normal School, has sent to Russia, which is searching for a rubber producing plant to grow in a temperate climate, complete specimens of dogbane, native to the Dakota Black Hills. The Soviet Institute of Agricultural Sciences is propagating this plant because of the latex its milky sap contains.

Servus Rubber Co., footwear manufacturer, Rock Island, Ill., after a spring and summer marked by subnormal business due to a large carry-over of stocks on dealers' shelves, in September found itself swamped with orders, a condition which still persists and has every indication of continuing in 1936. Company officials expect the new year to be one of the best in the history of the concern, which was founded in October, 1921. Total Servus employment now approximates nine hundred persons. Carl A. Hallgren is president of the company, which has restyled in a modern manner its complete line. An outstanding number this season is the "Monogram" gaiter, a fine roll design silk finish galosh to which the dealer attaches initialed caps that fit onto the regular snaps.

A Golden Jubilee

On February 24 Richard H. Geier, president and treasurer of Keystone Rubber Co., Inc., mechanical rubber goods house, 180 N. Wacker Dr., Chicago, Ill., will celebrate his first half century in the rubber business. He was born in Hamburg, Germany, March 28, 1870, but early in 1872 his parents migrated to Chicago, where their son later attended the public schools and also business college for a year and a half.

His first job was as a messenger boy with the Western Union Telegraph Co. He left this, however, to join, February 24, 1886, the Salisbury & Cline rubber store (later W. H. Salisbury & Co.) as errand boy. Young Geier advanced steadily through the shipping and stock room to the billing and cashier departments. Next he was made manager and buyer of the mechanical department and then secretary and a director of the company, which posts he held more than ten years. On January 1, 1922, he resigned to become manager of the new Chicago branch office of the Buffalo Weaving & Belting Co., Buffalo, N. Y.

Toloff Studio

Richard H. Geier

A nervous breakdown, which placed him on the inactive list for many months, led Mr. Geier to consider some less strenuous venture; so in February, 1923, he organized the Keystone company, becoming its president and treasurer, positions he still holds.

LEGAL

Patent Suit

1,374,505, E. Hopkinson, Method of making motor vehicle tires; Re. 17,618, same, Manufacture of tire casings; 1,480,719, J. R. Gammeter, Method and apparatus for making or manipulating tires; 1,507,563, A. O. Abbott, Method and apparatus for manufacturing tire casings; 1,372,567, T. Sloper, Method of manufacturing the covers of pneumatic tires; 1,487,033, same, Apparatus for making the covers of pneumatic tires; 1,607,266, H. V. Lough, Rubberized fabric and its method of manufacture, C. C. A., 6th Cir., Doc. 6,917, *The Firestone Tire & Rubber Co.* v. *United States Rubber Co.* Doc. 6,918, *United States Rubber Co.* v. *The Firestone Tire & Rubber Co.* Claims 2, 9, 15 of 1,374,505 held not infringed, and claims 16, 18, 23, and 27 held invalid; claims 1, 2, 18, and 19 of 1,480,719 held not infringed, claim 17 held invalid; claims 11, 23, and 31 of 1,507,563 held valid and infringed, bill dismissed without prejudice as to claims 1, 2, 6, 7, and 32; claims 2, 3, and 4 of 1,372,567 held not infringed; claims 1, 2, 3, 4, 6, 7, 8, and 14 of 1,487,033 held not infringed; claim 3 of 1,607,266 held not infringed; claims 13, 14, 15, 16, 17, 18, 19, 21, 24, and 25 of Re. 17,618 held invalid Oct. 10, 1935.

PACIFIC COAST

ON THE Pacific Coast the rubber industry in 1935 enjoyed a greater volume of business than in 1934. The percentage of profit, however, was very substantially less because of intensive competitive conditions. The price situation is being cleared up somewhat, and with the good volume of business continuing, manufacturers expect a better profit percentage. This increasing optimism, of course, is affected by the thought that 1936 is a presidential election year. Smaller companies making tire repair materials, though, because of the price situation are not favored with much good business. The big stock of low priced tires has also decreased the volume of repair trade, but it is felt that with the new year conditions should improve. All mechanical goods manufacturers, working full time, anticipate even better business.

California R. M. A.

The California Rubber Manufacturers Association held its annual election at the Jonathan Club on January 15. Charles N. Merralls, president of Rubbercraft Corp. of California, Ltd., was reelected president for the fifth consecutive year. T. Kirk Hill, president, Kirkhill Rubber Co., was reelected vice president, and Jack Ballagh, of Patterson-Ballagh Corp., was reelected secretary. Douglas Radford, president of West American Rubber Co. and Al. Rochlen, of Golden State Rubber Mills, Inc., were elected to comprise the board of directors for the ensuing year.

All members of the group reported an increase in their business over the previous year and look forward to a substantial increase in the months to come.

The speaker of the evening was Edwin B. Cassidy, C.P.A., who spoke on the laws and records pertaining to the new California and Federal Government Social Security Tax Assessments.

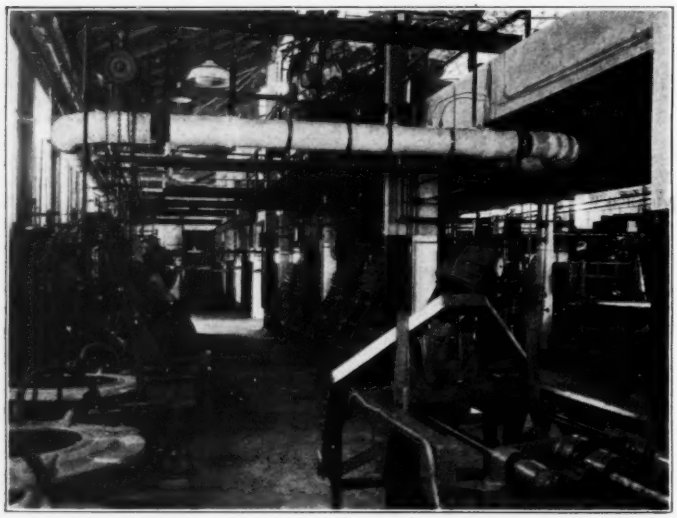
The consensus of opinion among the members was decidedly in favor of the abandonment of the NRA enactment and the belief that business will be a healthier growth if some of the burdensome tax measures can be repealed or revised to simplify the excessive bookkeeping and accounting due to these burdensome measures.

President Merralls in a brief address outlined the program for the furtherance of a more harmonious understanding between the different manufacturers in the industry and was promised the hearty cooperation of all. Several members reported a continual stream of "rush" orders, proving beyond a doubt that customers' stocks were at a point where replacements were absolutely necessary. Some members reported additions of new equipment, and Mr. Merralls, of Rubbercraft Corp., announced the completion and installation of a modern, up-to-date research laboratory including experimental mills, presses, testing machinery, and other devices for stock control and the general improvement of the firm's many products.

SOUTH AMERICA

Plant in Brazil

Companhia Brasileira de Artefactos de Barracha, a new manufacturer of tires, tubes, and other rubber goods, recently completed its plant at Rio de Janeiro, Brazil. Plans of the factory were developed in Akron, O., by F. A. Seiberling, president of the Seiberling Rubber Co., Chief Engineer K. B. Kilborn, and Dr. Arlindo Fernandes Dias, one of the directors of the Brazilian company in charge of production and sales, who visited Akron in December, 1933. Layouts and purchasing of equipment were made by Seiberling Rubber, and erection was under the supervision of A. A. Leedy, Seiberling Canadian plant superintendent. The new plant is one of the most modern constructed. Daily production will be 300 tires and 300 tubes. Exclusively Brazilian rubber will be used. The factory will be operated under the technical supervision of Seiberling Rubber, with L. C. Peterson as chief chemist and superintendent, W. W. Maddox in charge of production, J. Q. Lee in charge of engineering, Louis Hamley in charge of boiler operation, and Hermann Heydecker electrician.



Tire Vulcanizing Department of Cia. Brasileira de Artefactos de Barracha

Factory in Uruguay

A modern tire factory in Montevideo, the first in Uruguay, will begin production March 1, according to The B. F. Goodrich Co., which is loaning technical personnel to the enterprise organized and entirely financed by a group of Uruguayan merchants, bankers, and automotive leaders. This new South American tire concern, known as F.U.N.S.A., will operate under a long-term government grant and is headed by Raul Rohr, prominent Uruguayan industrial engineer.

Three Goodrich men, V. B. Gay, tire construction engineer, W. T. Stephans, chemist, and Charles Gardner, mechanical engineer, will supply technical information, train native personnel, and generally direct the manufacturing processes and plant operations of F.U.N.S.A.

Gardner has been in Montevideo since November supervising installation of production machinery; while Gay and Stephans sailed for South America January 25.

Rubber Shipments from Amazon Valley

Total rubber shipments from the Amazon Valley were 6,420 long tons in 1932, including shipments to Southern Brazil. Corresponding subsequent figures are: 1933, 9,883 long tons; 1934, 8,903 long tons; eight months of 1935, 6,603 long tons; showing a tendency to increase moderately this past year, for which the total will probably exceed 10,000 tons. The outlook for 1936 is for further moderate increase.

Rubber Shipments to Canada

Growth in direct rubber shipments from Malaya to Canada has been remarkable. Only 200,735 pounds were shipped in the year ended March, 1934, against 13,510,450 pounds in the year ended March, 1935. Formerly these shipments were usually made via United States ports.

Rubber Industry in Europe

GREAT BRITAIN

New Type of Golf Ball

Twenty-four British golf experts recently made playing tests of a new-type light experimental golf ball which has not yet been placed on the market. It weighs 1.275 ounces, against the American and British standard of 1.68 ounces. Its diameter is 1.645 inches, compared with the American standard of 1.68 and the British standard of 1.62 inches. The cover of the ball is slightly thicker than ordinary, being 0.08-inch thick and nearly indestructible. It compresses less than the modern high-tension ball and it floats. Machine tests of the new ball showed it has an average carry of 40 yards less than the standard British ball.

The advocates of the new ball declare it makes the short game much easier as approach shots can be struck more firmly and the ball shows a tendency to stay on the green where put.

1933 Rubber Statistics

The Report on the Import Duties' Act Inquiry (1933) Part I, recently published, gives interesting figures regarding the production of rubber goods in the United Kingdom during 1933, as compared with 1930. Statistics in both cases were compiled from data supplied by firms employing more than ten persons. An examination of the figures shows an increase in the amounts produced accompanied, however, by a decrease in value, which for the gross output was £24,231,000 in 1933 against £28,868,000 in 1930. The average number of employes was 51,677 in 1933 and 52,165 in 1930.

The 1933 output included sheets and threads wholly of rubber, 101,558 against 87,301 tons; reclaimed rubber, 6,070 against 13,894 tons; automobile tires, 5,654,000 against 5,198,000 units; cycle tires, 9,104,000 against 6,798,000 units; inner tubes for automobiles, 4,288,000 against 4,210,000 units; cycle tubes, 8,865,000 units against 5,578,000 units; balata belting, 1,260 against 1,385 tons; rubber and canvas belting, 3,860 against 2,750 tons; mats and matting, 4,133 against 3,282 tons; hose and tubing, 10,727,000 yards against 6,193,000 yards; rubber boots, 209,000 dozen pairs against 106,000 dozen pairs; shoes, 1,533,000 dozen pairs against 796,000 dozen pairs; rubber heels and soles, 7,149 against 5,043 tons; gloves, 86,000 dozen pairs against 22,000 dozen pairs; hard rubber, 1,535 against 2,259 tons.

Further data indicate that in the case of most items well over 90% of the home demand is covered by British goods. Only in regard to rubber footwear and gloves did foreigners have any footing to speak of, but even here the tariff policy was already beginning to make itself felt in 1933 so that whereas the share of British made rubber gloves in the home market had been only 31.7% in 1930, by 1933 this percentage had become 53.7%; for rubber boots the respective percentages were 34.4 and 47; and for shoes, 34.7 and 71.9.

As to exports, more than half the 1933 output of thread (562 out of 1,035 tons) went abroad, and over 25% of the production of tires and tubes for automobiles and bicycles, besides about the same proportion of canvas and rubber belting. However balata belting exports dropped 23.3%, 294 tons, of the output, against 31.7%, 440 tons, of the 1930 output.

Rubber-Reenforced Packing Paper

Bottles, jars, crockery, and the like, when transported, are usually wrapped in paper and packed in straw, sawdust, etc., to prevent breakage, a method which not only entails extra work and dirt in packing and unpacking, but adds to the bulk of the package and so to the freight costs. An ingenious inventor has sought to avoid all these disadvantages by substituting a special wrapping paper made of two plies of paper between which are arranged at regular intervals narrow strips or cords of rubber. The spacing of the bands can be adjusted to fit the article to be wrapped. The bands permit close packing, but at the same time prevent the articles from touching each other and are such efficient shock absorbers that even when a wrapped bottle, for instance, is dropped it does not break. The paper may be made into bags or cases on which advertisements or descriptive matter could be printed, or it may be supplied in sheets to be cut to size as required. Articles packed in this material and intended for the retail trade require no further wrapping as the reenforced paper is attractive.

British Notes

The British Tire & Rubber Co. reports net profits of £132,106 in the past business year against £126,715. The dividend was again 8%, but an additional cash bonus of 1½% was recommended. The business of the firm of James Lyne Hancock, Ltd., was acquired during the year, and improvements and replanning are taking place. The company has also acquired control of a well-established business in Denmark for the distribution of its products there, and the undertaking is already working profitably.

Since it was taken over by the British Tire & Rubber Co. in 1933, the India Rubber, Gutta Percha & Telegraph Works Co., Ltd., has improved its financial condition considerably. Liquid assets increased during the past business year from £57,483 to £581,375. Net profits were £51,186 against £26,053 in the preceding year and a loss of £46,226 in the year before that. The company declared a 6% dividend, the first to be paid in several years. Work is in progress in the rebuilding and modernizing of the Silvertown works, parts of which were originally erected seventy-two years ago. Foreign business increased during the year under review and despite unsettled conditions continued to expand during the first two months of the current year.

The Avon India Rubber Co., Ltd., also reports improved business and a record export trade during the past business year, when net profits of £15,141 were booked against a loss of £3,183 for 1933-1934. However it appears that although sales increased considerably, net profits were disappointing because of the high prices of raw materials and forward purchases at prices not fully maintained.

The New Eccles Rubber Works, Ltd., is in voluntary liquidation. The firm is one of the subsidiary companies taken over by the Dunlop Rubber Co. at the time of the fusion with the Macintosh group.

The House of Commons has approved an order by which such rubber tubing and piping as in the past were liable to only 10% ad valorem duty are now subject to a duty of 20%. By this order the opportunity has been taken to make an alternative specific duty to discourage attempts to import cheap Japanese garden hose.

DENMARK

The A. S. Forenede Gummi og Luftringefabriker Schionning & Arve, Copenhagen, Denmark, reports improved business during the past business year despite exchange difficulties which hampered imports of necessary raw materials. Net profits of 544,854 kroner against 421,735 kroner were booked, and a dividend of 9% proposed against 8% the preceding fiscal year.

GERMANY

Chlorinated Rubber Paint

At the Fifth Corrosion Convention, Berlin, November 19, 1935, G. Schultze discussed "Experiences with Chlorinated Rubber" and stressed various precautions to be taken when using it if best results are to be obtained. First the object to be painted must be thoroughly cleaned and freed of all rust. As the removal of the rust activates the iron surface, painting should take place immediately afterward, and care exercised to have the surface dry. The priming should be free of drying oils and should preferably contain only unsaponifiable synthetic softeners if there is to be permanent exposure to moisture. Such special chlorinated rubber miniums show exceptional hardness and adhesion so that damage during transportation, storage, and construction is markedly reduced. They harden at the surface remarkably soon so that one half hour after application a chlorinated rubber minium coat is unaffected by rain. For submarine purposes two priming coats are advised. Body paints should also contain only unsaponifiable synthetic softeners, and all coats should be applied by brush.

While normal chlorinated rubber paint dries at the surface very quickly and is free of all stickiness, drying through and through takes much longer as the last remnants of solvent are retained for a surprisingly long time so that definite minimum periods must be allowed to pass between coats. All parts to be protected should be easily accessible.

The uses of chlorinated rubber paints are limited by their sensitiveness to high temperatures and to ultra-violet light and to their solubility in organic solvents. If chlorinated rubber paints are exposed to permanent wet conditions, the temperature should not be above 60 to 65°, but dry heat up to 105° is permissible.

Not only iron, but also aluminum and its alloys, and all other metals, concrete, masonry, and wood can be perfectly protected against moisture by chlorinated rubber paint. Concrete containers, sunk deep into the earth, should be made watertight both inside and outside, but instead of a minium priming, a first coat of dilute chlorinated rubber solution containing a certain amount of unsaponifiable synthetic softener and alkali resistant pigment should be used. Masonry and wood may also be treated in this way.

Company Notes

Inland sales by Continental Gummiwerke A.G. again improved in quantity and value during 1935; while exports in value were 30% greater than in 1934. During 1935 a factory was started in Spain, which should open early this year.

The Celluloid Werk Aschaffenberg, R. Petri, Aschaffenberg, has put out a new steering wheel for automobiles, the rims and spokes of which are of steel about which is pressed a cover of a black elastic rubber. It is claimed that the soft rubber cover is not only more comfortable to the hand, but prevents shocks from jerks being transmitted to the hands and arms of the driver; while, finally, splintering in accidents is eliminated. Tests indicate that the above type of wheel has the capacity to take up about three times as much work as the usual wheels.

Among the rubber novelties at the Leipzig Fall Fair were scrub brushes with a narrow border of bristles and a center filled in with soft rubber loops, which, it is claimed, loosen and remove the finest particles of dust from carpets or floors. Also displayed were rubber ends to slip over the handles of brooms and mops to protect furniture and walls from damage and at the same time to provide a more comfortable grip for the hands.

A press report indicates that all automobile-owning members of the National Socialist party have been instructed to drive their cars slower in order to save material, especially rubber.

EUROPEAN NOTES

The Rubber-Latex-Poeder Cie, N.V., The Hague, Holland, has patented a method for covering objects and surfaces with rubber. In this one of the usual adhesives for rubber is first applied, then the paste of rubber powder mixed with vulcanizing agents and fillers, and the whole vulcanized. The binder may be asphalt, bitumen, or tar, which is especially useful on porous materials, as concrete, and also on metal surfaces. The rubber paste may be applied either directly after coating with the binder, or the latter may be allowed to dry first. Another method is to spray some rubber powder on the still soft adhesive layer before putting on the actual cover. This spraying with powdered rubber is also advised with latex, or a solution of rubber, gutta percha, or of rubber powder as adhesive, the rubber powder effecting a firm union between the adhesive and the rubber mix, it is claimed by the patentee.[1]

Fireproof rubber mixes claimed suitable as coating for electric cables applied between the insulated wires and the lead sheath, or even as insulation, are obtained by combining highly depolymerized rubber with all kinds of ammonium compounds or different carbonates, according to a recent patent of the N. V. Hollandsche Draad en Kabelfabriek, Amsterdam.[2] The rubber is depolymerized to a fluid state by one of the known methods. A saturated solution of NH_4Cl in water is mixed with talite in the proportion of 1:2 to a thick paste, dried at about 100° C. This material is then added to the depolymerized rubber in such proportion that the final product contains 25% rubber, 23% NH_4Cl, 26% talite, and 6% sulphur and accelerator (all calculated by weight). Then the whole is cured for about a half hour with saturated steam of 2 to 4 atmospheres. In this way, it is said, the ammonium chloride is very thoroughly dispersed in the rubber with hardly any decomposition, and a non-inflammable product results.

[1] Netherlands patent No. 67,040.
[2] Netherlands patent No. 64,875.

Conditions in the Polish rubber industry seem unfavorable for several of the larger concerns. The fate of the Pepege, formerly the largest Polish rubber manufacturing firm, is still uncertain; while the Primeros Rubber Co., Warsaw, is in liquidation. The English Polish Rubber Co., Gentleman, of Lodz, booked a loss of 108,934 zloty over 1934-35; Schweikert, also of Lodz, closed its last business year with a loss of 352,713 zloty; and Rygawar, Warsaw, also reported a loss, of 174,122 zloty.

Roca & Guix, manufacturer of rubber machinery, Barcelona, Spain, has changed its name to Rocaguix.

The Societe Plymouth Française, a branch of the Plymouth Rubber Co., Inc., Canton, Mass., U. S. A., recently equipped a factory at Feyzin (Isere), France, for the manufacture of rubber thread.

Applications Nouvelles de Caoutchouc was recently formed at Paris with a capital of 150,000 francs to manufacture rubber specialties including gas masks.

Revue Générale du Caoutchouc on January 1 moved its offices to 19 Boulevard Malesherbes, Paris 8e, France.

New Batteries

Two new storage batteries, known as 1X-13 and 1X-15, have been added to the Norwalk Tire & Rubber Co., Inc., battery line for replacement in light commercial vehicles. These wholly fill the gap between the passenger car batteries often used in light trucks and the heavy duty batteries used in large trucks and busses. These batteries differ in construction from the passenger type; that is, they are built of a heavier plate and insulated with Ace-Sil rubber separators. Thus they are able to withstand severe operating conditions to which they are subjected in light trucks and salesmen's cars where there is considerable mileage.

The rubber Ace-Sil separator has been adopted by Norwalk in its full line of high-type passenger batteries as well as the two new batteries for replacement in light commercial vehicles. This separator will withstand high temperatures and gives more resistance to plate buckle action than ordinary separators. It will not disintegrate or lose its tensile strength when subjected to high temperatures or when it is submerged in acid or water.

Rubber Industry in Far East

NETHERLAND INDIA

Export Duty Effect on Native Rubber Production

The special export duty of 29 guilder cents per kg. on native rubber was apparently effective in bringing shipments to a lower figure, for November exports were 9,200 tons against 17,600 tons the month before. However it is reported that tapping continued on as heavy a scale as ever, but that stocks have been held back to be released at the first opportunity. This state of affairs seems to have been going on all through the restriction period with the result that despite repeated increases in the duty and the purchase by the government of coupons for 20,000 tons of estate rubber, native outputs so far still exceed permissible quotas by about 23,000 tons.

Many consider that the export duty is a failure and is defeating its own ends: it is not keeping native exports within bounds and it is seriously impoverishing native rubber growers. Most of the tapping today is by natives who depend chiefly on rubber for their livelihood; the high export duty leaves them a very small margin indeed; so to make enough money to subsist on they tap as much as they can; then the duty is raised because the shipments have increased, and they are obliged to tap still more to make up the difference in their steadily diminishing income.

Reports, especially from Borneo, reveal conditions resulting from the working of the export duty, which the government certainly could not have foreseen when it introduced the measure. It seems that the natives there, despite all their labor, make barely enough from their rubber to pay for a little rice. Their clothing is little better than rags, and altogether their condition is said to resemble that of the most poverty-stricken sections of Java. The huge funds that have accumulated from the duty are not being properly handled, and the natives benefit little by this money despite the promises made them; it is claimed that large amounts are being spent on elaborate public works as the building of beautiful new automobile roads, for instance, and the like. The whole method of controlling native outputs as at present followed is considered a dismal failure from every point of view, and the urgency for the speedy introduction of more suitable measures is most strongly stressed.

Now that individual restriction as planned by the government is considered the proper solution, those well acquainted with conditions fear that this would prove as great a failure in its way as the export duty. A well-known West Borneo rubber planter, who has a thorough knowledge of the native rubber industry and native psychology, some time ago presented a plan for restricting native rubber providing that tapping should be prohibited altogether during regularly recurring periods during which the natives should be encouraged to grow foodstuffs.

So far it is not known whether the government is considering the plan, which, on the face of it, would appear to be simpler of control than a system embodying licenses or coupons. But the government certainly is aware of the importance of stimulating the production of food by the natives in the rubber areas and plans an intensive program for promoting the growing of rice and other food crops. Under the existing circumstances it certainly would help the government to control native outputs and at the same time improve their own condition, if the natives could be made to depend less on rubber and more on other crops so that one can only wish the government well in its praiseworthy efforts in this direction.

The export duty has, it is clear, brought poverty to most native growers, but in spite of all the criticism a careful consideration of all facts would reveal that at least as regards checking native exports, the measure has not been quite such a failure as some picture it. After all, it has generally been agreed that by 1935 the potential native output would be well over 350,000 tons a year. It is hardly likely that the full amount would have been produced if native rubber were free, but shipments in the latter part of 1933 and the early part of 1934 indicate very clearly that without the duty the outputs would certainly have exceeded the 200,000-ton mark.

Preparing Native Rubber in Borneo

The West Borneo pioneer already mentioned, Th. A. de Neve, who frequently writes under the nom de plume of Molenstein, gives interesting details of native methods of preparing rubber under restriction as practiced in his district. After the introduction of the export duty the natives figured they would be able to reserve for themselves a larger proportion of their gross takings if they prepared dry rubber; so, says Mr. de Neve in *Indische Mercuur*, in the Chinese districts they have cooperated with the Chinese in erecting small remilling installations which have sprung up like mushrooms and are found at regular intervals all along the roads in the interior. These small shops are very primitive installations, very simple, very practical, and very cheap. The latex is coagulated in kerosene tins cut in half lengthwise, and the sheet is rolled out in a mangle consisting of two rolls, one smooth and one ribbed; the rolls cost 10 guilders each and will produce 1 picul (133⅓ pounds) of rubber in two hours. The rolls are manufactured by Chinese in Singapore and are imported by hundreds. The coagulant used is a 3% solution of acetic acid to which some tannic acid obtained from the bark of a local plant is added. The tannic acid reduces the drying and smoking period from the usual six days to three days, and the sheets thus obtained are faultless in appearance, having a beautiful glossy red-brown color. The tannic acid retards vulcanization somewhat, but buyers judge only by appearance, and the sheets are sold on the market at only a fraction under the price for standard smoked sheet. In shipping, wrappings or cases are dispensed with; the sheets are simply piled in bundles and well bound with strong ratan. The whole process, says Mr. de Neve, is so efficient and so economical that Europeans would have difficulty in producing under these costs.

The local remilling shops, he further points out, will eventually kill the larger remilling factories in the chief cities. At the same time, however, their own existence would be threatened if dealers began to buy up liquid latex on a large scale. And apropos of this, he adds, there are no grounds for the fear that the native latex would be polluted or impure; on the contrary in this district it is not less pure than that which is brought in by coolies on estates.

Latex Promotion

Dr. G. M. Kraay, chief of the Rubber Division of the West Java Experimental Station, is making a visit to Japan, Shanghai, and Hong Kong, with the purpose of interesting manufacturers there in rubber and latex. Press reports indicate that efforts will be made to stimulate the use of latex in textile and shoe industries in particular.

MALAYA

Restriction Quotas

The increased basic quotas of Netherland India naturally are much discussed here. But on the whole there seems little inclination to quarrel with the extra amount allowed or to see any menace to the statistical position in the concession itself. Causing uneasiness in some quarters is the consideration that other producers may demand similar concessions and, what is just as important, that the native problem will be further complicated rather than aided by this measure. It is felt that the Dutch, despite their strenuous efforts, have not handled the matter of native control as well as they should; it is pointed out that on the whole consistency has been lacking in carrying out the system of levying export duty and that the reduction in the duty a year ago was a mistake.

The *Straits Times* points out that now the difference between Malaya's 1936 quota at 569,000 tons and that of Netherland India at 500,000 tons is only 69,000 tons, whereas Malaya's original quota for 1936 was 126,000 tons above that of the Dutch; again the difference in Malaya's favor for the 1938 quota is now only 62,000 tons, whereas it had been 117,000 tons. It apparently does not see in the granting of the increase to the Dutch a recognition of the justness of their claim that their output had originally been considerably underestimated, but rather a generous gesture, an emergency measure to help tide the Dutch over the period until they can introduce some other system of control. But it is pessimistic about the whole business and appears convinced of the hopelessness of attempting to control native rubber.

The *Times of Malaya* represents the more optimistic view and, discussing the revised quotas, says: "Whether the D.E.I. were under-assessed in the original agreement or not, it is clear that the increase in the basic quota, which they have been seeking for some months and have now obtained, was essential as a prelude to individual restriction, the entire amount being devoted to the native producer and thus giving the authorities a very necessary margin on which to work. No other country has been called upon to make a sacrifice and the amount concerned is small when measured against world consumption and output as a whole. In fact, it strikes us as being a small price to pay for the laying of the D.E.I. native bogey once and for all, for close observers of the position are convinced that this is what it will achieve."

Malayan Rubber and Italy

As a result of the application of the "economic sanctions" against Italy, that country is faced with an acute shortage of rubber. Small wonder then that she should be making strenuous efforts to obtain supplies from the East at all costs. Singapore merchants are reported to have been approached by various agents from Spain, Germany, Japan, South America, and even the United States to ignore the sanctions and supply rubber to Italy. Local customs authorities therefore have a new difficulty to cope with and are carefully scrutinizing all outgoing shipments of rubber and other war necessities sought by Italy; several cargoes have already been held up, it seems.

What Italian purchases of rubber must mean to local merchants is evident when it is considered that during 1934 Italy bought from Malaya sheet and crepe representing $9,347,096 (Straits currency). In addition she took latex to a value of $287,383, sole crepe for $11,509, and jelutong for $556. Compared with figures for 1933 and 1932, these amounts show a very marked increase which cannot altogether be ascribed to the rise in prices, but suggest that Italy may have been stocking up in preparation for this war. In 1933 the value of sheet and crepe imports was $4,412,595 and in 1932 $1,750,009. Latex imports at the same time increased comparatively more rapidly and were $57,906 in 1933 against $12,738 in 1932. For sole crepe only 1934 figures are given.

At the same time reports from Italy indicate that the greatest efforts are being made to conserve supplies; wherever possible substitutes are employed; there is a marked increase in the use of reclaim; tires are retreaded and repaired over and over again; while automobile traffic in Italy has been ordered reduced—all in the attempt to release more tires for the very arduous duty in Abyssinia. There, it appears, roads are either non-existent or are of the most primitive type, and altogether driving conditions are such that even the best truck tires have been known, on occasion, to wear out in a matter of days.

Incidentally Italian automobiles, the well-known Fiat cars, and tires are now barred from Malaya.

Malayan Notes

Col. B. J. Eaton is retiring as director of the Rubber Research Institute of Malaya, thus ending thirty years of service in Malaya. He came here in 1906 to act as government chemist; his ability was soon recognized, and in 1910 he became Director of Agriculture, a position he held again in 1921 and once more in 1926. Toward the end of the latter year he was appointed head of the Chemical Division of the Rubber Research Institute and three years later became Director.

The well-known Prang Besar Rubber Estate is reducing its capital from £200,000 to £115,500 "by the cancellation of paid-up capital lost or unrepresented by assets to the extent of 10s. a share." The estate has produced some outstanding Hevea clones and in the past derived considerable income from the sale of bud-wood; this business has fallen off markedly.

Bathroom squeegees of rubber, now produced locally, are said to be cheap in comparison with those imported from England.

A novel method of smuggling rubber was discovered recently when customs officers stopped two automobiles coming from Johore to Singapore and on examination found about 400 pounds of smoked sheet tightly packed in the roof of each car. Besides these, five other cars, said to have been used in the same way, have also been held on the same charges.

Ohio

(*Concluded from page 52*)

tures, will cut down road delays, make necessary fewer tire changes, and give greater non-skid mileage for the particular type of service for which the tires are built.

R. R. Olin Laboratories, Akron, is entering its tenth year of operating a consulting service and maintaining experimental laboratory facilities for the rubber and allied industries.

Automotive Products Co., manufacturer of trimming supplies and replacement parts, 3000 Woodhill Rd., Cleveland, has just gone into production on a V-type automotive fan belt.

White Rubber Co., Ravenna, recently entertained forty-five employes at its second annual dinner. President E. J. Smith was one of the speakers.

Mohawk Rubber Co., Akron, through S. S. Miller, chairman of the board and first head of the company, has announced the election to the presidency, on January 14, of Ray E. Bloch, to succeed Charles Borland, who resigned to act as general manager of the Federal Electric Co., Chicago, Ill. J. T. Stubbs was named secretary to succeed L. T. Noel, resigned.

Mr. Bloch, a native Ohioan, has lived in Akron since he was a child. For a time he worked in the golf ball department of The B. F. Goodrich Co. When Mohawk was organized, he joined it as secretary to Mr. Miller. He later became assistant treasurer, treasurer, and then vice president. He has served on the executive committee of The Rubber Manufacturers Association, Inc., and is an executive of the Fairlawn Country and Kiwanis clubs. Mr. Bloch is married and the father of one daughter.

Patents and Trade Marks

MACHINERY

United States

19,789 (Reissue). **Inflatable Ball Treater.** B. Kozmer, Chicago, Ill.

2,021,130. **Stock Storer.** E. B. Erickson, Los Angeles, Calif., assignor, by mesne assignments, to United States Rubber Co., New York, N. Y.

2,021,299. **Dipped Goods Apparatus.** J. R. Gammeter, Akron, O.

2,021,373. **Tube Vulcanizer.** C. E. Maynard, Northampton, assignor to Fisk Rubber Corp., Chicopee Falls, both in Mass.

2,021,953. **Cementer.** L. N. Bishop, Salem, Mass., assignor to United Shoe Machinery Corp., Paterson, N. J.

2,021,961. **Reclaimed Rubber Treater.** W. C. MacFarlane, South Gate, Calif., assignor to Xylos Rubber Co., Akron, O.

2,021,983. **Inner Tube Apparatus.** J. F. Cavanagh, assignor to W. W. Potter, both of Pawtucket, R. I.

2,022,040. **Brake Lining Tester.** W. S. James, assignor, by mesne assignments, to Bendix Aviation Corp., both of South Bend, Ind.

2,022,230. **Rubber Tube Apparatus.** J. F. Cavanagh, assignor to W. W. Potter, both of Pawtucket, R. I.

2,022,308. **Vulcanizer.** L. D. Bax, Denver, Colo.

2,022,322. **Coating Apparatus.** G. E. Pelton, Alexandria, Va.

2,022,515. **Temperature Measurer.** J. L. Orchard, Cambridge, assignor to Cambridge Instrument Co., Ltd., London, both in England.

2,022,608. **Sanitary Pad Shield Apparatus.** A. N. Spanel, Rochester, N. Y.

2,022,851 and 2,022,852. **Material Crinkler.** J. J. Galligan and W. J. Robinson, both of Providence, R. I., assignors to United States Rubber Products, Inc., New York, N. Y.

2,023,002. **Molded Article Remover.** G. P. Bosomworth, assignor to Firestone Tire & Rubber Co., both of Akron, O.

2,023,273. **Sheet Material Apparatus.** C. W. Leguillon, Akron, O., assignor to B. F. Goodrich Co., New York, N. Y.

2,023,378. **Pile Fabric Cut Edge Binder.** W. A. Anderson, Hightstown, assignor to C. H. Davison, Edgerstoune, Princeton, both in N. J.

2,023,407. **Stop Mechanism.** H. Z. Cobb, Providence, R. I., assignor, by mesne assignments, to United States Rubber Co., New York, N. Y.

2,023,575 and 2,023,576. **Tire Tread Splitter.** G. F. Connelly, San Francisco, Calif.

2,023,665. **Continuous Article Vulcanizer.** L. J. Clayton, assignor to Viceroy Mfg. Co., Ltd., both of Toronto, Ont., Canada.

2,024,149. **Tire Tube Apparatus.** F. A. Daly, assignor to W. W. Potter, both of Pawtucket, R. I.

2,024,279. **Vulcanizer.** J. G. Ebenhack, Wyoming, O.

2,024,304. **Inner Tube Apparatus.** W. W. Potter, Pawtucket, R. I.

2,024,405. **Adhesive Applier.** J. E. Warrell, assignor to Pharis Tire & Rubber Co., both of Newark, O.

2,024,554. **Tire Vulcanizer.** L. T. Vogt, Coburg, Victoria, Australia.

2,024,577 and 2,024,578. **Inner Tube Splicer.** J. I. Haase, Akron, O., assignor to Wingfoot Corp., Wilmington, Del.

2,024,617. **Rubber Content of Latex Determiner.** J. S. Ward and S. D. Gehman, both of Akron, O., assignors to Wingfoot Corp., Wilmington, Del.

2,024,811. **Vulcanizer.** F. Van Camp, assignor to Societé Anonyme, des Etablissements J. Laroche-Lechat, both of Ghent, Belgium.

2,024,888. **Retreader.** H. L. Shaw, Frostburg, Md.

2,024,941. **Tire Retread Vulcanizer.** C. E. Miller, Anderson, Ind.

Dominion of Canada

354,318. **Continuous Article Vulcanizer.** Viceroy Mfg. Co., Ltd., assignee of L. J. Clayton, both of Toronto, Ont.

United Kingdom

432,226. **Tire Lever.** R. S. Osborne, Birmingham.

432,412. **Tire Mold.** Soc. Italiana Pirelli, Milan, Italy.

432,601. **Tire Builder.** D. Bridge & Co., Ltd., Castleton. (National Rubber Machinery Co., Akron, O., U. S. A.)

432,675. **Floor Covering Vulcanizer.** Kooperativa Forbundet, Forening U.P.A., Stockholm, Sweden.

432,680. **Ebonite Article Vulcanizer.** Soc. Italiana Pirelli, Milan, Italy.

432,801. **Thread Cutter.** Dunlop Rubber Co., Ltd., London, and J. Healey, Leicester.

432,883. **Pile Fabric Apparatus.** X. Banister, Braintree.

432,943. **Belt Vulcanizer.** Aktieselskapet Den Norske Remfabrik, Oslo, Norway.

433,122. **Ball Projecting Appliance.** Dunlop Rubber Co., Ltd., London, and H. F. L. Jenkins and S. G. Ball, both of Birmingham.

433,303. **Latex Evaporator.** Rubber Producers Research Association, G. Martin, W. S. Davey, and L. Lindsell-Stewart, all of London.

433,959. **Bottle Cap Apparatus.** A. J. Jonsson, Linköping, Sweden.

434,007. **Watchcase Vulcanizer.** D. Bridge & Co., Ltd., Castleton, assignee of T. H. Williams, Akron, O., U. S. A.

434,263. **Latex Centrifugal Separator.** A. Nyrop and Koefoed, Hauberg, Marstrand & Helweg Aktieselskabet Titan, both of Copenhagen, Denmark.

434,440. **Tire Mold.** L. Herbert, Frankfurt a. M., Germany.

434,577. **Ball Mold.** J. A. Law, Kensington, Victoria, Australia.

434,742. **Tire Vulcanizing Mold.** W. J. Woodcock and John Bull Rubber Co., Ltd., both of Leicester.

434,792. **Tire Repair Vulcanizer.** B. V. Vertel, Budapest, Hungary.

434,949. **Ball Mold.** J. A. Talalay, Bedford.

435,012. **Hydraulic Press.** J. Van Liempt, Krefeld, Germany.

Germany

622,277. **Spreader and Method of Spreading Fluid Masses.** International Latex Processes, Ltd., St. Peter's Port, Channel Islands. Represented by R. and M. M. Wirth and C. Weihe, all of Frankfurt a.M., and T. R. Koehnhorn, Berlin.

623,384. **Machine and Method of Making Rubber Thread.** Kolnische Gummi-Faden-Fabrik vorm. Ferd. Kohlstadt & Co., Koln-Deutz.

623,586. **Machine and Method of Crimping Thin Rubber Sheets.** Radium Gummiwerke m.b.H., Koln-Dellbruck.

623,745. **Spreading Machine.** International Latex Processes, Ltd., St. Peter's Port, Channel Islands. Represented by R. and M. M. Wirth and C. Weihe, all of Frankfurt a.M., and T. R. Koehnhorn, Berlin.

PROCESS

United States

2,021,418. **Printing by Transfer on Colored Base Material.** O. R. Huggins and F. D. Snell, assignors to Decorative Development, Inc., all of Brooklyn, N. Y.

2,021,870. **Shoe Fabric.** C. E. Reynolds, Watertown, assignor to Cambridge Rubber Co., Cambridge, both in Mass.

2,022,183. **Printing Plate.** T. C. Browne, Hinsdale, Ill.

2,022,217. **Connecting Elastically Rims and Hubs.** E. Rimailho, Paris, France.

2,022,444. **Hosiery.** G. S. Van Voorhis, Northampton, assignor to United Elastic Corp., Easthampton, both in Mass.

2,022,462. **Rubber Products.** H. J. Elwell, Newton, assignor to Vultex Corp. of America, Cambridge, both in Mass.

2,022,518. **Electric Heater.** J. H. Payne, Ballston Spa, N. Y., assign to General Electric Co., a corporation of N. Y.

2,022,519. **Electric Heating Pad.** J. H. Payne, Ballston Spa., N. Y., assignor to General Electric Co., a corporation of N. Y.

2,022,967. **Shoe.** F. J. MacDonald, Brookline, assignor to Hood Rubber Co., Inc., Watertown, both in Mass.

2,023,264. **Composite Article.** F. F. Brucker, Akron, O., assignor to B. F. Goodrich Co., New York, N. Y.

2,023,268. **Rubber Strips.** H. M. Dodge, Akron, O., assignor to B. F. Goodrich Co., New York, N. Y.

2,023,688. **Road Covering Surface.** B. W. D. Lacey and P. J. Bawcutt, both of Birmingham, assignors to Dunlop Rubber Co., Ltd., London, all in England.

2,024,167. **Shoe.** J. S. Kent, Jr., assignor to M. A. Packard Co., both of Brockton, Mass.

2,024,174. **Knitted Fabric.** R. H. Lawson, Pawtucket, and R. F. Lovell, Providence, assignors to Hemphill Co., Central Falls, all in R. I.

2,024,235. **Attaching Rubber Soles to Shoes.** A. D. Macdonald, Malden, assignor to Boston Blacking & Chemical Co., Boston, both in Mass.

2,024,236. **Attaching Leather Soles to Shoes.** A. D. Macdonald, Malden, assignor to Boston Blacking & Chemical Co., Boston, both in Mass.

2,024,237. **Cementing Channel Flaps.** A. D. Macdonald, Malden, assignor to Boston Blacking & Chemical Co., Boston, both in Mass.

Dominion of Canada

354,285. **Metal or Wood Surface Protection.** International Latex Processes, Ltd., St. Peter's Port, Channel Islands, assignee of Naugatuck Chemical Co., Naugatuck, Conn., assignee of F. L. McLaughlin, Detroit, Mich., both in the U. S. A.

354,404. **Moistureproof Material.** du Pont Cellophane Co., Inc., New York, assignee of J. H. Collins, Kenmore, both in N. Y., U. S. A.

354,462. **Pile Fabric.** N. Strachovsky, Paris, and J. F. Paulsen, Viroflay, Seine et Oise, both in France, assignees of X. Banister, Braintree, England.

United Kingdom

432,803. **Chlorinated Rubber Film.** J. G. Moore, Runcorn, and Imperial Chemical Industries, Ltd., London.

432,884. **Variegating Rubber.** J. A. Talalay, Bedford.

433,278. **Artificial Denture.** E. Raab and A. Just, both of Budapest, Hungary.

433,367. **Coating Aluminum and Its Alloys.** Peintal Soc. Anon., Lausanne, Switzerland.

433,395. **Weaving Elastic Fabric.** Lastex Yarn & Lactron Thread, Ltd., and F. Watkinson, both of London.

433,441. **Rubber Article.** International Latex Processes, Ltd., St. Peter's Port, Channel Islands.

433,667. **Latex-Treated Mat.** F. Schurholz Ges., Berlin, Germany.

433,777. **Attaching Rubber to Artificial Silk.** Wingfoot Corp., Wilmington, Del., U. S. A.

433,912. **Glove.** A. H. Stevens, London. (Seiberling Latex Products Co., Barberton, O., U. S. A.)

434,049. **Treating Textiles.** Soc. Des Procedes Ecla, Paris, France.

434,137. **Preserving Fruit with Latex.** W. J. H. Hinrichs, Hamburg, Germany.

434,191. **Lining Shoots.** C. Macbeth, Birmingham, and Rubber Producers Research Association, London.

434,222. **Sealing Cans and Jars.** Crosse & Blackwell, Ltd., W. Clayton, and R. I. Johnson, all of London.

434,266. **Adhesive.** I. G. Farbenindustrie A. G., Frankfurt a. M., Germany.

434,365. **Skirt.** Ellenson Mfg. Co., Ltd., and J. Isherwood, both of Radcliffe.

434,700. **Filtering Gases.** Soc. Italiana Pirelli, Milan, Italy.

435,101. **Brake Lining.** Johns-Manville Corp., New York, N. Y., U. S. A., assignee of P. D. Cannon.

435,163. **Hand Wheel.** Soc. Italiana Pirelli, Milan, Italy.

435,394. **Preserving Food with Latex.** W. J. H. Hinrichs, Hamburg, Germany.

435,395. **Treating Yarn.** J. Brandwood, Southport.

435,856. **Pile Carpet.** J. G. Lambert, Leicester, and Brintons, Ltd., Kidderminster.

Germany

622,238. **Curing Sponge Rubber in Molds.** Fabbriche Riunite Industria Gomma Torino, Turin, Italy. Represented by G. Winterfeld and A. Weber, both of Berlin.

623,245. **Surgeons' Mask.** J. E. Leduc, Outremont, Quebec, Canada. Represented by W. Harmsen.

623,283. **Brushes with Soft Rubber Loops.** T. Fiz, Satteldorf, Wurttbg.

CHEMICAL

United States

2,021,143. **Dispersion Production.** W. S. Calcott, Pennsgrove, and I. Williams, Woodstown, both in N. J., assignors to E. I. du Pont de Nemours & Co., Wilmington, Del.

2,021,318. **Chlorinated Rubber.** J. McGavack, Leonia, N. J., assignor, by mesne assignments, to United States Rubber Co., New York, N. Y.

2,021,947. **Paper Waterproofing Composition.** J. E. Schopp, Oak Park, Ill.

2,022,614. **Stabilizing Halogenated Caoutchouc.** G. Balle and F. Grom, both of Frankfurt a. M.-Hochst, assignors to I. G. Farbenindustrie A. G., Frankfurt a. M., all in Germany.

2,022,887. **Colored Rubber.** H. G. Kiernan, Buffalo, assignor to National Aniline & Chemical Co., Inc., New York, both in N. Y.

2,022,953. **Accelerator.** C. Coleman, Passaic, N. J., assignor, by mesne assignments, to United States Rubber Co., New York, N. Y.

2,022,979. **Accelerator.** W. Rittmeister. Dessau, assignor to Deutsche Hydrierwerke A. G., Berlin-Charlottenburg, both in Germany.

2,023,296. **Cellular Rubber.** G. W. Trobridge, Sutton Coldfield, assignor to Dunlop Rubber Co., Ltd., London, both in England.

2,023,582. **Hard Rubber Coating.** L. B. Haines, Baltimore, Md., assignor to Western Electric Co., Inc., New York, N. Y.

2,024,124. **Doll's Face Plastic Composition.** J. O. Barker, assignor to Sweets Laboratories, Inc., both of New York, N. Y.

2,024,470. **Accelerator.** C. O. North, assignor to Rubber Service Laboratories Co., both of Akron, O.

2,024,477. **Antioxidant.** W. Scott, Nitro, W. Va., assignor to Rubber Service Laboratories Co., Akron, O.

2,024,567. **Organic Disulphides.** A. M. Clifford, Stow, O., assignor to Wingfoot Corp., Wilmington, Del.

2,024,575. **Accelerator.** A. J. Gracia, Cuyahoga Falls, O., assignor to Wingfoot Corp., Wilmington, Del.

2,024,605 and 2,024,606. **Accelerator.** L. B. Sebrell, Cuyahoga Falls, O., assignor to Wingfoot Corp., Wilmington, Del.

2,024,613. **Accelerator.** J. Teppema, Cuyahoga Falls, O., assignor to Wingfoot Corp., Wilmington, Del.

2,024,987. **Plastic Rubber Derivative.** T. F. Ford, Akron, O., assignor to B. F. Goodrich Co., New York, N. Y.

2,025,017. **Chlorinated Rubber Production.** E. Möllney, assignor to Chemische Fabrik Buckau, both of Ammendorf, Germany.

Dominion of Canada

354,278. **Rubber Processing.** Dominion Rubber Co., Ltd., Montreal, P. Q., assignee of W. P. ter Horst, Packanack Lake, N. J., U. S. A.

United Kingdom

430,906. **Chlorinated Rubber.** F. P. Leach, Frodsham, W. D. Spencer, Liverpool, and Imperial Chemical Industries, Ltd., London.

430,935. **Creaming Latex.** Rubber Producers Research Association, London. (Rubber Research Institute of Malaya, Kuala Lumpur, F. M. S.)

430,953. **Latex Coating Composition.** International Latex Processes, Ltd., St. Peter's Port, Channel Islands.

431,011. **Plastic Product.** W. J. Tennant, London. (J. C. Patrick, Trenton, N. J., U. S. A.)

431,191. **Rubber Composition.** W. J. Hall, Cumberland.

431,195. **Coloring Rubber.** I. G. Farbenindustrie A. G., Frankfurt a. M., Germany.

431,360. **Latex Adhesive.** W. G. Dewsbury and A. Davies, both of London.

431,410. **Cellular and Porous Rubber.** U. Pestalozza and Soc. Italiana Pirelli, both of Milan, Italy.

431,575. **Porous Rubber.** International Latex Processes, Ltd., St. Peter's Port, Channel Islands, and W. H. Chapman, E. W. B. Owen, and D. W. Pounder, all of Birmingham.

431,577. **Age Resister.** Imperial Chemical Industries, Ltd., London, and W. Baird and T. Birchall, Manchester.

431,869. **Rubber.** R. M. Ungar and P. Schidrowitz, both of London.

432,022. **Cleansing Composition.** E. Schnabel, Berlin, Germany.

432,032. **Rubber Composition.** Pure Calcium Products Co., Painesville, O., U. S. A., and A. H. Stevens, London.

432,242. **Metallizing Rubber.** M. Ow-Eschingen, Vienna, Austria.

432,368. **Accelerator.** E. G. M. R. Lege, Paris, France.

432,405. **Coating Composition.** J. P. Henharen, Durban, South Africa.

432,493. **Cement.** A. S. Colling, London.

432,551. **Fireproof Composition.** J. Talbot, Ilford.

432,584. **Rubber-Cork Composition.** W. H. Stevens and Clayton & Stevens, Ltd., both of London.

432,762. **Coating Composition.** J. Y. Johnson, London. (I. G. Farbenindustrie A. G., Frankfurt a. M., Germany.)

432,819. **Fireproof Latex Composition.** G. Schwedler and H. Schweitzer, both of Hanover, Germany.

432,905. **Chlorinated Rubber.** J. G. Moore, Runcorn, and Imperial Chemical Industries, Ltd., London.

433,082. **Halogenating Rubber.** Rubber Producers Research Association and G. F. Bloomfield, both of London, and E. H. Farmer, Richmond.

433,116. **Preserving Latex.** A. T. B. Kell, Beckenham.

433,196. **Chlorinated Rubber.** K. S. Jackson, Runcorn, and Imperial Chemical Industries, Ltd., London.

433,246. **Chlorinated Rubber.** Thurm & Beschke Komm.-Ges., Prague, Czechoslovakia.

433,252. **Chlorinating and Vulcanizing Rubber.** International Latex Processes, Ltd., St. Peter's Port, Channel Islands.
433,276. **Puncture Sealing Composition.** A. K. Prentice and K. E. Thedvall, both of Salisbury, Southern Rhodesia.
433,313. **Chlorinated Rubber.** T. N. Montgomery, Runcorn, and Imperial Chemical Industries, Ltd., London.
433,396. **Chlorinated Rubber Composition.** E. Frolich, Harz, Germany.
433,418. **Rubber Composition.** International Latex Processes, Ltd., St. Peter's Port, Channel Islands.
433,452. **Synthetic Welding Agent.** E. I. du Pont de Nemours & Co., Wilmington, Del., U. S. A.
433,727 and 433,728. **Cable Composition.** Liverpool Electric Cable Co., Ltd., and A. E. Hughes, both of London.
433,741. **Rubber Composition.** W. W. Groves, London. (I. G. Farbenindustrie A. G., Frankfurt a. M., Germany.)
433,867. **Rubber Mixture.** J. Y. Johnson, London. (I. G. Farbenindustrie A. G., Frankfurt a. M., Germany.)
433,916. **Impression Surface Composition.** F. B. Dehn, London. (Vulcan Proofing Co., Brooklyn, N. Y., U. S. A.)
433,994. **Plastic Composition.** J. P. Henharen, Durban, South Africa.
434,159. **Chlorinated Rubber Composition.** J. R. Geigy A. G., Basle, Switzerland.
434,214. **Treating Latex.** Metallges. A. G. and J. Jaenicke, both of Frankfurt a. M., Germany.
434,317. **Rubber and Bitumen Composition.** Internationale Vereeniging Voor De Rubber-En Andere Cultures in Nederlandsch-Indie, The Hague, Holland.
434,596. **Accelerator.** E. I. du Pont de Nemours & Co., Wilmington, Del., U. S. A.
434,600. **Rubber Composition.** E. Goltstein, Rheydt, Germany.
434,630. **Puncture Sealing Composition.** M. Hagino, Vancouver, B. C., Canada.
434,783. **Coating Composition.** I. G. Farbenindustrie A. G., Frankfurt a. M., Germany.
434,806. **Accelerator.** Rubber Service Laboratories Co., Akron, O., U. S. A.
434,870. **Chlorinated Rubber Composition.** Naamlooze Vennootschap Tot Voortzetting Der Zaken Van P. Schoen & Zoon, Zaandam, Holland.
434,951. **Age Resister.** Imperial Chemical Industries, Ltd., London, and W. Baird, Manchester.
435,027. **Conductor Insulating Composition.** Siemens & Halske A. G., Berlin, Germany.
435,270. **Coating Composition.** J. Tengler, assignee of J. Tengler, both of Thurgovie, Switzerland.
435,548, 435,597, and 435,598. **Lubricant.** J. Y. Johnson, London. (I. G. Farbenindustrie A. G., Frankfurt a. M., Germany.)
435,716. **Accelerator.** Dunlop Rubber Co., Ltd., London, and D. F. Twiss and F. A. Jones, both of Birmingham.

Germany

621,702. **Stable Chlorinated Rubber.** I. G. Farbenindustrie A. G., Frankfurt a. M.
622,320. **Rubber and Asbestos Articles.** Dewey & Almy Chemical Co., Cambridge, Mass., U. S. A. Represented by G. Lotterhos, Frankfurt a. M.
622,471. **Halogenation Products from Rubber, Etc.** Metallgesellschaft A. G., Frankfurt a. M.
622,578. **Rubber Conversion Products.** I. G. Farbenindustrie A. G., Frankfurt a. M.
622,579. **Curing Covers for Balls.** Deutsche Dunlop Gummi-Co. A. G., Hanau a. M.
622,643. **Rubber Coagula.** Dunlop Rubber Co., Ltd., London, England, and Anode Rubber Co., Ltd., St. Peter's Port, Channel Islands. Represented by C. Wiegand, Berlin.
623,710. **Preparing Rubber Vulcanizates.** H. Ziegner, Hagen i. W.
623,943. **Microporous Rubber from Rubber Dispersions.** Accumulatoren Fabrik A.G., Berlin.
623,988. **Softener and Gelatination Agent.** I. G. Farbenindustrie A. G., Frankfurt a.M.

GENERAL

United States

2,017,881. **Dental Tool.** A. D. Wiseman, San Francisco, Calif.
2,017,891. **Skid Preventer.** G. L. Briggs, Oneida, N. Y.
2,017,912. **Fastener.** C. T. Manville, Woodbury, Conn., assignor, by mesne assignments, to United States Rubber Co., New York, N. Y.
2,017,978. **Tire Safety Valve.** A. Lapp, Cleveland, O.
2,017,982. **Sole Pressing Pad.** F. R. Merritt, Haverhill, Mass., assignor to United Shoe Machinery Corp., Paterson, N. J.
2,018,029. **Typewriter Eraser Holder.** L. C. Neff, Brooklyn, N. Y.
2,018,089. **Tubing Handler.** B. L. Quarnstrom, assignor to Bundy Tubing Co., both of Detroit, Mich.
2,018,111. **Vacuum Pump.** A. M. Babitch, Flint, assignor to General Motors Corp., Detroit, both in Mich.
2,018,134. **Electric Socket and Casing.** F. C. Kollath, Chicago, assignor of ½ to D. Woodhead, Evanston, both in Ill.
2,018,160. **Wheel Tester.** I. A. Weaver, assignor to I. A. Weaver Engineering Co., both of Springfield, Ill.
2,018,189. **Tire.** W. L. Prince, Belleville, Ill.
2,018,230. **Rope.** A. Robertson, assignor to Robertson's Rope (Patents), Ltd., both of Aberdeen, Scotland.
2,018,245. **Shoe Stiffener.** F. L. Ayers, Watertown, Mass., assignor to Brown Co., Berlin, N. H.
2,018,260. **Highway Traffic Director.** C. Henderson, Lansdowne, Pa., assignor to S. S. White Dental Mfg. Co., a corporation of Pa.
2,018,271. **Article and Nonslip Support.** S. Lewis, Woodmere, N. Y.
2,018,322. **Suprapubic Drainer.** L. Savally, New York, N. Y.
2,018,338. **Connecting Device.** D. C. Abdelnour, Port Chester, assignor to D. A. & H. Corp., New York, both in N. Y.
2,018,409. **Container Hood Applier.** W. C. McCoy, Shaker Heights, O.
2,018,427. **Vehicle Body Suspension.** G. H. Taber, Binghamton, N. Y.
2,018,461. **Cable.** N. L. Morgan, Mt. Royal, P. Q., Canada, assignor to Western Electric Co., Inc., New York, N. Y.
2,018,484. **Plug Fuse and Adapter.** G. R. Brown, Stratford, Conn., assignor to General Electric Co., a corporation of N. Y.
2,018,501. **Stencil Sheet Assembly.** W. G. D. Orr, assignor to A. B. Dick Co., both of Chicago, Ill.
2,018,512. **Electric Heating Pad.** W. W. De Laney, New Haven, and W. R. Weeks, Hamden, assignors to Seamless Rubber Co., Inc., New Haven, all in Conn.
2,018,517. **Bandage.** E. Fetter, Baltimore, Md.
2,018,524. **Carpet.** A. W. Holmberg, Naugatuck, Conn., assignor, by mesne assignments, to United States Rubber Co., New York, N. Y.
2,018,548. **Surf Board.** W. T. Currey, Galveston, Tex.
2,018,559. **Tennis Ball.** E. E. Horner, assignor to Horner Brothers Woolen Mills, both of Eaton Rapids, Mich.
2,018,584. **Valve Stem.** F. H. Watson, Jonesboro, Ark.
2,018,597. **Tire Mounting.** P. M. Bourdon, Paris, assignor to Michelin & Cie., Clermont-Ferrand, both in France.
2,018,598. **Twin Tired Wheel Mounting.** P. M. Bourdon, Paris, assignor to Michelin & Cie., Clermont-Ferrand, both in France.
2,018,604. **Bicycle Tire.** R. C. Collins, Westfield, N. J.
2,018,665 and 2,018,666. **Garment.** A. L. Flesh, assignor to Atlas Underwear Co., both of Piqua, O.
2,018,668. **Underwear.** A. J. Harwood, Richmond, Ind., assignor to Atlas Underwear Co., Piqua, O.
2,018,684. **Sole Press.** G. A. Mussells, Reading, Mass.
2,018,798. **Electrical Control System.** L. J. Madden, Syracuse, N. Y.
2,018,808. **Sole Presser.** F. Ricks, Leicester, England, assignor to United Shoe Machinery Corp., Paterson, N. J.
2,018,860. **Support.** H. C. Lord, Erie, Pa.
2,018,870. **Motor Vehicle.** C. R. Paton, Birmingham, assignor to Packard Motor Car Co., Detroit, both in Mich.
2,018,897. **Golf Club.** W. F. Reach, Springfield, Mass., assignor to A. G. Spalding & Bros., New York, N. Y.
2,018,903. **Finger Stall Toothbrush.** R. G. Stevens, Chicago, Ill.
2,018,948. **Slide Fastener.** G. H. C. Corner, Birmingham, England, assignor to Hookless Fastener Co., a corporation of Pa.
2,018,981. **Abdominal Belt.** J. Tietjen, New York, N. Y.
2,019,052. **Joint.** H. C. Lord, Erie, Pa.
2,019,060. **Mouth Prop.** J. A. N. Thibert, Fitchburg, Mass., assignor to J. Bird Moyer Co., Inc., Philadelphia, Pa.
2,019,068. **Wheel.** F. P. Bowers, Cleveland, O.
2,019,086. **Buoyant Clothing.** W. Milne, Dumbarton, Scotland.
2,019,129. **Doll Head.** J. R. Gammeter, Akron, O., assignor to B. F. Goodrich Co., a corporation of N. Y.
2,019,140. **Undergarment.** A. R. Kneibler, assignor to Coopers, Inc., both of Kenosha, Wis.
2,019,148. **Doll.** M. S. Lower, Wadsworth, assignor to Sun Rubber Co., Barberton, both in O.
2,019,197. **Bag.** A. N. Spanel, Rochester, N. Y.
2,019,211 and 2,019,212. **Enclosing Letters in Envelopes.** H. Clare, Berne, Switzerland.

2,019,240. **Pen Filling Bottle.** A van der Woerd, Amsterdam, Netherlands.
2,019,257. **Valve.** R. H. Gibbs, Floral Park, assignor of ½ to M. Blake, Garden City, both in N. Y.
2,019,297. **Cable.** I. T. Faucett, Westerleigh, assignor to General Cable Corp., New York, both in N. Y.
2,019,368. **Scouring Device.** C. B. Stevens, Portland, Ore.
2,019,532. **Electrical Connector Plug.** C. E. Gilbert, New York, N. Y.
2,019,563. **Shoe Pressing Pad.** S. J. Finn, Beverly, Mass., assignor to United Shoe Machinery Corp., Paterson, N. J.
2,019,640. **Musical Instrument Keyboard.** G. Woodhouse, London, England.
2,019,663. **Running Board.** J. F. Duffy, assignor to Duffy Mfg. Co., both of Holland, Mich.
2,019,696. **Shoe Press.** A. G. Siegfried, Kansas City, Mo.
2,019,740. **Container.** S. L. Starkey, Parkersburg, W. Va.
2,019,823. **Storage Battery Box.** R. H. Lewis, assignor to Firestone Battery Co., both of Akron, O.
2,019,835. **Catamenial Bandage.** W. Voss, Berlin-Neukolln, Germany.
2,019,860. **Carboy Box.** A. W. James, Hillside, N. J.
2,019,924. **Waistband.** W. Murphey, Chattanooga, Tenn.
2,019,964. **Tool Cushion.** F. B. Hamerly, Aurora, assignor to Independent Pneumatic Tool Co., Chicago, both in Ill.
2,019,987 and 2,019,988. **Tire Cover.** G. A. Lyon, Allenhurst, assignor to Lyon, Inc., Asbury Park, both in N. J.
2,019,996. **Corset and Brassiere.** I. Roth, New York, N. Y.
2,020,037. **Safety Shoe.** H. G. McMurray, Wakefield, and M. G. Norman, Beverly, assignors to Beckwith Mfg. Co., Boston, all in Mass.
2,020,092. **Motor Mounting.** G. W. Allen, Hyde Park, assignor to B. F. Sturtevant Co., Inc., Boston, both in Mass.
2,020,135. **Running Board.** G. F. Cavanagh, Euclid, assignor to Ohio Rubber Co., Cleveland, both in O.
2,020,155. **Waterproof Suit.** F. G. Molter, Hempstead, N. Y.
2,020,190. **Tire.** C. A. Jones, South Gate, Calif.
2,020,214. **Book Cover.** A. G. Rendall, assignor to Morland & Impey, Ltd., both of Birmingham, England.
2,020,236. **Hair Waving Cap.** E. G. Brown, Roanoke, Va.
2,020,240. **Shoe.** H. Cochran, Lewisburg, Tenn.
2,020,288. **Footwear Apparatus.** W. H. Bresnahan, Lynn, Mass., assignor, by mesne assignments, to Compo Shoe Machinery Corp., New York, N. Y.
2,020,293. **Sink Scoop.** H. L. Adelstein, Upland, Calif.
2,020,395. **Metatarsal Pad.** A. A. Bilbrey and M. D. Vinyard, both of Salem, Ore.; assignors to said Vinyard.
2,020,423. **Artificial Limb.** R. E. Lofts, Pineville, Mo.
2,020,436. **Shaft Seal.** F. Shenton, assignor to Frick Co., both of Waynesboro, Pa.
2,020,479. **Planographic Printing Element.** B. L. Sites, assignor to Miehle Printing Press & Mfg. Co., both of Chicago, Ill.
2,020,484. **Luminous Ball.** C. T. Turner, Lakefield, Ont., Canada.
2,020,542. **Belt Connector.** A. L. Freedlander, assignor to Dayton Rubber Mfg. Co., both of Dayton, O.
2,020,576. **Tile.** K. R. Runde, St. Louis, Mo.
2,020,581. **Rail Sealing Strip.** H. D. Sevison, Elkhart, Ind., assignor to Adlake Co., Chicago, Ill.
2,020,612. **Tennis Ball.** J. T. McGrath and R. B. Wilman, assignors to New England Fibre Blanket Co., all of Worcester, Mass.
2,020,619. **Switch.** J. B. Pumphrey, assignor of ½ to C. W. Gill and ¼ to J. M. Hardie, all of Abilene, Tex.
2,020,633. **Spinning Solution Variation Equalizer.** H. Dannenberg, Dessau-in-Anhalt, assignor to I. G. Farbenindustrie A. G., Frankfurt a. M., both in Germany.
2,020,634. **Rupture Support.** C. O. Denton, Hoopeston, Ill.
2,020,679. **Golf Club.** H. D. Fitzpatrick, Glasgow, Scotland, assignor to Clifton, Ltd., Douglas, Isle-of-Man.
2,020,692. **Resilient Device.** O. W. Loudenslager, assignor to Goodyear-Zeppelin Corp., both of Akron, O.
2,020,767. **Patch.** E. Bullis, Amsterdam, and M. Jacobson, Johnstown, both in N. Y.
2,020,776. **Laminated Material.** G. Goebel, assignor to Crown Cork & Seal Co., Inc., both of Baltimore, Md.
2,020,784. **Windshield Wiper.** J. Kalske and J. B. Byrnes, both of Butte, Mont.
2,020,958. **Truss Pad.** B. F. Pease, Wyoming, O.
2,021,024. **Grinder.** L. E. Ross, Dallas, Tex.
2,021,033. **Undergarment.** A. M. Thomas, assignor to Thomas & Marcus, Inc., both of New York, N. Y.
2,021,042. **Tennis Ball Recover Pack.** M. M. Bayon, New Orleans, La.
2,021,058 and 2,021,059. **Impression Material.** L. E. Harrison, Long Beach, assignor to Oramold Products Corp., W. Hollywood, both in Calif.
2,021,115. **Doll.** W. C. Jackson, assignor to Tingley-Reliance Rubber Corp., both of Rahway, N. J.
2,021,154 and 2,021,155. **Tire Inflator.** W. N. Smith, New York, N. Y.
2,021,176. **Repair Plug.** E. W. Curtis, Chicago, Ill.
2,021,192. **Shoe.** C. Miller, Long Island City, N. Y.
2,021,259. **Bottle Closure.** H. O. Magnuson, assignor to Champion Foundry & Machine Co., both of Chicago, Ill.
2,021,288. **Battery.** F. S. Carlile, Abington, Pa., assignor to Carlile & Doughty, Inc., a corporation of Pa.
2,021,295. **Interchangeable Tire Valve.** E. Eger, Grosse Pointe Park, Mich., assignor, by mesne assignments, to United States Rubber Co., New York, N. Y.
2,021,335. **Dust Mop Bumper.** A. D. Sund, Santa Rosa, Calif.
2,021,352. **Elastic Fabric.** W. Eustis, Newton, assignor to Kendall Co., Walpole, both in Mass.
2,021,356. **Belt Connector.** A. L. Freedlander, assignor to Dayton Rubber Mfg. Co., both of Dayton, O.
2,021,371. **Polisher.** F. H. Manchester, Akron, O., assignor to Wingfoot Corp., Wilmington, Del.
2,021,422. **Padded Horseshoe Calk.** E. Matthews, Hamilton, Ont., Canada.
2,021,425. **Toilet Seat and Cover.** E. J. Nielsen, Rockford, assignor, by mesne assignments, to A. Dullere, Freeport, both in Ill.
2,021,467. **Arch Support.** L. Rosenthal, Pittsburgh, Pa.
2,021,500. **Tire.** M. R. De Vita, Brooklyn, assignor of ½ to A. V. Levey, New York, both in N. Y.
2,021,522. **Running Board Mat.** W. F. Schacht, Huntington, Ind.
2,021,568. **Tire Deflation Indicator.** O. D. North and P. G. Hugh, assignors to Scammell Lorries, Ltd., all of London, England.
2,021,646. **Automatic Tire Inflator.** H. C. Crandall, Kansas City, Kan.
2,021,713. **Life Preserver Mattress.** A. Borino, Nutley, N. J.
2,021,729. **Metatarsal Pad and Heel Cup.** C. O. Johnson, Indianapolis, Ind.
2,021,825. **Resilient Pad.** A. H. Ackerman, assignor to Studebaker Corp., both of South Bend, Ind.
2,021,868. **Packing Joint.** J. M. Patterson, Waban, assignor to Boston Woven Hose & Rubber Co., Cambridge, both in Mass.
2,021,878. **Carboy Cushion.** R. W. Lahey, New Rochelle, N. Y., and H. A. Kast, Erie, Pa., assignors to American Cyanamid & Chemical Corp., New York, N. Y.
2,021,879. **Carboy Package.** R. W. Lahey, New Rochelle, N. Y., and K. M. Sieg, Elizabeth, N. J., assignors to American Cyanamid & Chemical Corp., New York, N. Y.
2,021,940. **Garter Band.** J. D. Lathrop, Los Angeles, Calif.
2,021,975. **Fabric Shrinker.** J. H. Wrigley, Worthington, and A. Melville, Standish, both in England, assignors, by mesne assignments, to Cluett Peabody & Co., Inc., Troy, N. Y.
2,022,002. **Physical Culture Appliance.** L. M. Jacks, London, England.
2,022,090. **Battery Container.** W. C. Roberts, Akron, O., assignor to B. F. Goodrich Co., New York, N. Y.
2,022,129. **Tire Cover.** G. A. Lyon, assignor to Lyon, Inc., both of Detroit, Mich.
2,022,169. **Bedding Clamp.** M. Yamashiro, Los Angeles, Calif.
2,022,196. **Safety Valve Stem.** B. Greco, Somerville, N. J., assignor of ¼ to J. Schaffer and ¼ to C. De Angelis, both of New York, N. Y.
2,022,349. **Bumper Guard.** F. C. Howard, assignor to American Automatic Devices Co., both of Chicago, Ill.
2,022,350. **Braid Elastic Fabric.** O. E. Huber, Reading, assignor to Narrow Fabric Co., W. Reading, both in Pa.
2,022,474. **Truss.** F. B. Miller, Berryville, Va.
2,022,545. **Inner Tube Valve Stem.** E. H. Marken, Minneapolis, Minn.
2,022,567. **Endless Track.** A. Kegresse, Courbevoie, France.
2,022,576. **Tractor Lug.** H. Sturn, Bushton, Kan.
2,022,609. **Sanitary Pad Shield.** A. N. Spánel, Rochester, N. Y.
2,022,626. **Coupling.** W. Weis, New York, N. Y., assignor to Certified Flexible Couplings, Inc., a corporation of N. Y.
2,022,759. **Abrading Tool.** W. E. Delano, Brockton, Mass., assignor to United Shoe Machinery Corp., Paterson, N. J.
2,022,850. **Face Lifter and Massager.** B. T. Fuqua, Amarillo, Tex.
2,022,893. **Abrasive Article.** R. H. Martin, assignor to Norton Co., both of Worcester, Mass.
2,022,998. **Battery Cell.** C. K. Bam-

ber, assignor to Bambairtite Battery Co., Ltd., both of London, England.

2,023,026. **Fountain Syringe.** T. W. Miller, assignor to Faultless Rubber Co., both of Ashland, O.

2,023,135. **Vehicle Suspension.** C. A. Hawkins, San Francisco, Calif.

2,023,177. **Pen Wiper.** P. A. Lloberes, Barcelona, Spain.

2,023,183. **Dress Shield.** J. Rath, assignor to Julius Friedlaender Gummiwaren-Fabrik, G.m.b.H., both of Berlin, Germany.

2,023,214. **Mask.** W. J. Westmore, Beverly Hills, assignor to Paramount Productions, Inc., Los Angeles, Calif.

2,023,251. **Rubber Material.** J. Stein, Brooklyn, N. Y.

2,023,252. **Sanitary Garment.** J. Stein, Brooklyn, and H. H. Mosher, New York, both in N. Y.; said Mosher assignor to said Stein.

2,023,253. **Sanitary Garment.** J. Stein, Brooklyn, N. Y., and H. H. Mosher, Grantwood, N. J.

2,023,266. **Protected Shafting.** G. C. Davis, Dallas, Tex., assignor to B. F. Goodrich Co., New York, N. Y.

2,023,270. **Plant Moisture Storing Material.** A. C. Fischer, Chicago, Ill.

2,023,274. **Footwear.** L. H. L'Hollier, Waltham, assignor to Hood Rubber Co., Inc., Watertown, both in Mass.

2,023,280. **Construction Unit.** A. B. Merrill, Akron, O., assignor to B. F. Goodrich Co., New York, N. Y.

2,023,306. **Tire Valve Retainer.** G. O. Buck, Tigerton, Wis.

2,023,307. **Artificial Ground Surface.** E. Burton, assignor to Sports Grounds Rubber Surfacing Co., Ltd., both of London, England.

2,023,310. **Refueling Aircraft in the Air.** A. J. Cobham, assignor to Alan Cobham Aviation, Ltd., both of London, England.

2,023,314. **Swimming Appliance.** E. B. C. Doran, Eagle Rock, Calif.

2,023,394. **Shampoo and Massage Device.** E. J. Blanks, Lynchburg, Va.

2,023,421. **Power Transmission Device.** D. Heyer, assignor to United States Electrical Mfg. Co., both of Los Angeles, Calif.

2,023,438. **Drawing and Spinning Roll.** W. F. Ray, assignor to F. G. Karg, both of Chicago, Ill.

2,023,529. **Expansion Joint Filler.** H. C. Jussen, Cincinnati, O., assignor to Philip Carey Mfg. Co.

2,023,600. **Windshield Heater.** T. H. Liebler, assignor of ⅓ to W. C. Campbell and ⅓ to J. D. Clark, all of Butler, Pa.

2,023,672 and 2,023,673. **Tennis Ball Cover.** D. W. Ellis, Springfield, assignor to A. D. Ellis Mills, Inc., Monson, both in Mass.

2,023,729. **Garter.** H. E. Forkey, assignor to United Elastic Corp., both of Easthampton, Mass.

2,023,737. **Endless Track Vehicle.** L. Martinage, Paris, France.

2,023,756. **Car Truck.** N. R. Brownyer, assignor to Timken-Detroit Axle Co., both of Detroit, Mich.

2,023,917. **Refrigerator Gasket.** L. H. Darbyshire, Detroit, Mich., assignor, by mesne assignments, to Borg-Warner Corp.

2,023,932. **Ball Washer.** S. G. Meikle, Chicago, Ill.

2,023,975. **Gripper.** W. Qualey, Cincinnati, O., assignor, by mesne assignments, to Cupples Co., St. Louis, Mo.

2,024,031. **Defroster.** J. G. Edwards, Bradley, Ark.

2,024,040. **Tire.** F. Hollingsworth, Altrincham, England.

2,024,092. **Mold.** C. K. Cox, St. Louis, Mo.

2,024,100, 2,024,101, and 2,024,102. **Bumper.** M. Kahn, Chicago, assignor to H. H. Kahn, Wilmette, both in Ill.

2,024,134. **Catamenial Bandage.** B. Anderson, Wichita, Kan.

2,024,154. **Sole Pressing Means.** S. J. Finn, Beverly, Mass., assignor to United Shoe Machinery Corp., Paterson, N. J.

2,024,155 and 2,024,156. **Elastic Yarn.** B. H. Foster, Maplewood, N. J., assignor, by mesne assignments, to United States Rubber Co., New York, N. Y.

2,024,265. **Horseshoe.** A. V. and J. E. Anderson and J. C. Lee, all of Hamilton, assignors to George H. Jackson, Ltd., Toronto, Ont., Canada.

2,024,341. **Urinary Receptacle.** G. C. De Graff, Des Moines, Iowa.

2,024,429. **Liquid Receptacle Support.** T. W. Casey, assignor to Seiberling Latex Products Co., Akron, O.

2,024,430. **Hot Water Bottle.** T. W. Casey, assignor to Seiberling Latex Products Co., both of Akron, O.

2,024,443. **Belt.** A. L. Freedlander, assignor to Dayton Rubber Mfg. Co., both of Dayton, O.

2,024,459. **Driving Mechanism.** R. K. Lee, Highland Park, assignor to Chrysler Corp., Detroit, Mich.

2,024,491. **Surgical Bandage.** H. B. Veysey, Woodstock, Ont., Canada.

2,024,539. **Pessary.** J. Schmid, assignor to Julius Schmid, Inc., both of New York, N. Y.

2,024,547. **Plug Socket.** H. L. Strongson, Syracuse, assignor to B. D. Colen, Great Neck, L. I., N. Y.

2,024,591. **Abrasive Wheel.** F. H. Manchester, Akron, O., assignor to Wingfoot Corp., Wilmington, Del.

2,024,600. **Impregnated Fiber Article.** G. A. Richter and M. O. Schur, assignors to Brown Co., Berlin, N. H.

2,024,637. **Storage Battery Container.** H. D. Geyer, Dayton, O., assignor, by mesne assignments, to General Motors Corp., Detroit, Mich.

2,024,696. **Sole Pressing Member.** J. Lieberman, South Bend, Ind.

2,024,704. **Semi-elastic Braced Tie.** A. Rosenberg, Brooklyn, N. Y.

2,024,728. **Resilient Support.** H. L. Galson, Philadelphia, Pa., assignor to Baldwin-Southwark Corp., a corporation of Del.

2,024,766. **Overshoe.** C. H. Ingwer, Elyria, O.

2,024,777. **Cushioned Universal Joint.** J. J. Neumann, Omaha, Neb.

2,024,780. **Fluid Pressure Controller.** C. D. Ruckman, Hobson, Mont.

2,024,837. **Cushion and Elastic Stuffing.** I., H., and A. Singer, all of Montreal, P. Q., Canada.

2,024,908. **Hot Water Bottle.** A. Blum, Vienna, Austria.

2,024,988. **Storage Battery.** K. W. Gasche, Stow, assignor to Firestone Battery Co., Akron, both in O.

Dominion of Canada

353,634. **Nursing Bottle.** E. Geistlinger, Peekskill, N. Y., U. S. A.

353,637. **Rail Tire.** C. F. Hirshfeld, Detroit, Mich., U. S. A.

353,667. **Sleeping Garment.** Earnshaw Knitting Co., assignee of G. F. Earnshaw, both of Newton, Mass., U. S. A.

353,670. **Helve Hammer.** High Speed Hammer Co., Inc., Rochester, assignee of E. F. Meyering, Irondequoit, both in N. Y., U. S. A.

353,723. **Container Closure.** G. E. Bennett, San Mateo, Calif., U. S. A.

353,735 and 353,736. **Sponge Applicator.** W. B. Jones, Chicago, Ill., U. S. A.

353,737. **Undergarment.** J. E. Lennard, Dundas, Ont.

353,855. **Plumbing Flusher.** A. J. German, Detroit, co-inventor, and A. R. Reno, River Rouge, assignee of all the interest of L. J. Sole, Detroit, co-inventor with the said A. J. German, all in Mich., U. S. A.

353,869. **Shoe.** C. F. and F. A. Rohn, co-inventors, both of Milwaukee, Wis., U. S. A.

353,871. **Horseshoe.** J. E. Anderson, Hamilton, Ont.

353,891. **Engine Mounting.** H. C. Lord, Erie, Pa., U. S. A.

353,892. **Joint.** H. C. Lord, Erie, Pa., U. S. A.

353,904. **Glass Gasket Strip.** C. H. Walker, Detroit, Mich., U. S. A.

354,002. **Inner Tube.** Wingfoot Corp., Wilmington, Del., assignee of W. E. Shively, Fairlawn, O., both in the U. S. A.

354,004. **Tire Bead.** Wingfoot Corp., Wilmington, Del., assignee of J. C. Warden, Akron, O., both in the U. S. A.

354,006. **Retractible Valve Stem.** Wingfoot Corp., Wilmington, Del., assignee of E. C. Kastner, Fairlawn, O., both in the U. S. A.

354,039. **Hose.** D. B. Gish, Springfield, Mass., U. S. A.

354,065. **Printing Unit.** L. J. Welch, Chicago, Ill., U. S. A.

354,112. **Self-supporting Hosiery.** Holeproof Hosiery Co. of Canada, Ltd., London, Ont., assignee of C. V. Loomis and R. C. Breyer, co-inventors, both of Shorewood, Wis., U. S. A.

354,147. **Bottle Closure and Liquid Dropper.** T. J. Dykema, Pittsburgh, Pa., U. S. A.

354,153. **Pneumatic Cushion.** H. C. Stanley and W. H. Smith, co-inventors, both of Manchester, England.

354,190. **Tire.** C. G. Kranz, Chicago, Ill., U. S. A.

354,214. **Horseshoe.** M. Van Gestel, Antwerp, Belgium.

354,222. **Sash Guide.** Adlake Co., Chicago, Ill., assignee of W. S. Hamm, Elkhart, Ind., both in the U. S. A.

354,231. **Hydraulic Machine.** Baldwin-Southwark Corp., assignee of R. E. B. Sharp, both of Philadelphia, Pa., U. S. A.

354,272. **Pipe Coupling.** Crane Co., assignee of A. M. Houser, both of Chicago, Ill., U. S. A.

354,281. **Pipe Joint.** B. F. Goodrich Co., New York, N. Y., assignee of T. D. Nathan, Cuyahoga Falls, O., both in the U. S. A.

354,339. **Railway Tire.** G. F. A. Corts, Göteborg, Sweden.

354,352. **Elastic Bandage.** F. Kazda, Vienna, Austria.

United Kingdom

429,963. **Vehicle Spring Suspension.** Dunlop Rubber Co., Ltd., London, and A. Healey, Birmingham.

430,185. **Nurser.** G. R. Scarborough, Cosby.

430,193. **Spring.** Dunlop Rubber Co., Ltd., London, and B. W. D. Lacey and W. V. Clarke, both of Birmingham.

430,209. **Piston Packing.** Hydraulic Brake Co., Detroit, Mich., U. S. A.
430,256. **Acid Container.** St. Albans Rubber Co., Ltd., and A. Thorp, both of London.
430,301. **Hat.** J. N. Wolf, Philadelphia, Pa., U. S. A.
430,323. **Horseshoe.** O. Harsem, Oslo, Norway.
430,378. **Foundation Columns.** British Steel Piling Co., Ltd., E. C. Pound, and A. Hiley, all of London.
430,403. **Road Surface Heater.** F. C. Rands and T. F. N. Alexander, both of London.
430,487. **Vehicle Hood.** A. Kellner, Berne, Switzerland.
430,497. **Transmitter and Receiver.** Atlas-Werke A. G., Bremen, Germany.
430,530. **Sleeping Bag.** J. Langdon & Sons, Ltd., and H. T. Langdon, both of Liverpool.
430,531. **Fire Extinguisher.** E. M. Cross, Didcot.
430,533. **Endless Belt Conveyer.** E. Southgate, Ilford.
430,549. **Axle.** Steel Wheel Corp., Chicago, Ill., U. S. A.
430,581. **Cable.** Siemens & Halske A. G., Berlin, Germany.
430,586. **Conductor Support.** J. Bate & Co., Ltd., and S. N. Fisher, both of Birmingham.
430,626. **Bridle.** A. E. Tilburn, St. Kilda, Australia.
430,632. **Twisting Frame Yarn Tensioner.** J. Templeton & Son, Ltd., and J. Baxter, both of Ayr, Scotland.
430,668. **Hose.** Automotive Products Co., Ltd., and E. B. Boughton, both of London, and Fabbriche Riunite Industria Gomma Torino and R. Laguidara, both of Turin, Italy.
430,676. **Pipe Joint.** Victaulic Co., Ltd., and E. Du C. Haarer, both of London.
430,680. **Toy Gun.** J. M. F. Craven and Peacock & Co., Ltd., both of London.
430,720. **Bookbinding.** F. P. D'Huy, Amersfoort, Holland.
430,758. **Boot Machine.** United Shoe Machinery Corp., Paterson, N. J., assignee of E. A. Bessom, Marblehead, Mass., both in the U. S. A.
430,762. **Golf Teacher.** R. J. Westlake, Cornwall.
430,799. **Toy Gun.** C. Schmeltz, Nice, France.
430,805. **Elastic Fabric.** E. Krenzler, Barmen, Germany.
430,820. **Road Roller.** G. W. and D. T. Teed (representatives of H. W. Teed), both of Kent.
430,892. **Pipe Coupling.** E. H. Reid and C. L. Blume, both of Toronto, Ont., Canada.
430,908. **Irradiation Apparatus.** Vitamina Soc. Anon. and R. Potencier, both of Nord, France.
430,944. **Sliding Clasp Fastener.** R. J. J. Dumas, St. Etienne, France.
430,950. **Safety Lamp.** J. T. Shevlin, London. (Siemens-Schuckertwerke A. G., Berlin, Germany.)
430,951. **Motor Vehicle Controller.** Daimler-Benz A. G., Stuttgart, Germany.
431,007. **Golf Practicer.** S. G. Jones, London.
431,008. **Seat Cover.** H. V. Durose, Birmingham.
431,023. **Boot.** A. Barker & Sons, Ltd., and E. Barker, both of Northampton.
431,049. **Flying and Steering Teacher.** G. H. Miles, New Barnet.
431,056. **Railway Vehicle Undercarriage.** R. Morris, Ltd., C. H. Taylor, and N. R. Maxwell, all of Bolton.
431,085. **Tape.** H. D. Symons and H. D. Symons & Co., Ltd., both of Kingston Hill.
431,137. **Electromagnetic Interrupter.** P. R. Mallory & Co., Inc., Indianapolis, Ind., U. S. A.
431,152. **Bearing.** J. Ortholan, Buenos Aires, Argentina.
431,184. **Floor Mat.** India Tyre & Rubber Co., Ltd., and C. J. Pomeroy, both of Inchinnan.
431,188. **Towel Holder.** W. H. Ayre and G. Edley, both of Sheffield.
431,193. **Gas Protection Chamber.** G. F. Jaubert, Paris, France.
431,197. **Bowden Mechanism.** Amal, Ltd., and T. A. Tisdell, both of Birmingham.
431,219. **Saddle.** H. and J. Jelley, both of Birmingham.
431,333. **Electric Incandescent Lamp Filament.** British Thomson-Houston Co., Ltd., London, assignee of W. P. Zabel, Cleveland Heights, O., U. S. A.
431,346. **Chair Combined with Table.** R. Plested, Wallsend-on-Tyne.
431,366. **Massager.** General Electric Co., Ltd., London, and D. A. Jennings, Birmingham.
431,482. **Mattress.** Crown Bedding Co., Ltd., and L. S. Wallis, both of Birmingham.
431,483. **Galvanic Footwear.** J. H. Lester, Surbiton.
431,484. **Mold.** E. Freysinnet, Neuilly-sur-Seine, France.
431,515. **Bowden Mechanism.** O. E. Simmonds and Simmonds Aerocessories, Ltd., both of London.
431,516. **Tire.** S. D'Ayguesvives, Paris, and D. T. Tosoni, Clichy, both in France.
431,571. **Repeater.** Electrical Research Products, Inc., New York, N. Y., assignee of W. S. Gorton, Maplewood, N. J., both in the U. S. A.
431,572. **Gramophone Pick-up.** Electrical Research Products, Inc., New York, assignee of J. H. King, Amityville, both in N. Y., U. S. A.
431,579. **Inductance.** Allgemeine Elektricitats-Ges., Berlin, Germany.
431,604. **Fuel Container.** Pressed Steel Co. of Great Britain, Ltd., and E. Speed, both of Cowley.
431,619. **Flexible Band Apparatus.** Norddeutsche Seekabelwerke A. G., Nordenham, Germany.
431,624. **Yielding Shaft Coupling.** E. W. Moss, London. (Ingersoll-Rand Co., Jersey City, N. J., U. S. A.)
431,663. **Bandage.** L., W., and O. Flemmich, (trading as A. Flemmich's Sohne), all of Vienna, Austria.
431,671. **Respiratory Appliance.** R. P. Howes, London.
431,694. **Fish Package.** J. H. Smart, St. Andrew's Dock.
431,695. **Liquid Electrolytic Purification.** J. Billiter, Paris, France.
431,724. **Deaf Persons' Portable Set.** R. S. Smith, Stoke-on-Trent.
431,738. **Tire Pressure Gage.** T. G. Baker, Liverpool, and J. Callaghan, Bootle.
431,742. **Compressed Air Container.** M. L. J. Lambert, C. Latham, and I. D. Kelley, all of St. Louis, Mo., U. S. A.
431,754. **Swimming Costume.** T. Glen, Dee Why, and T. P. Brand, Narrabeen, both in N. S. W., Australia.
431,758. **Loud Speaker.** H. Vogt, Berlin, Germany.
431,765. **Horseshoe.** P. C. Mannien, Antwerp, Belgium.
431,770. **Ball Catch.** B. Lee, Drayton, and F. B. Bevis, Waterlooville.
431,791. **Windscreen Cleaner.** J. Lucas, Ltd., and S. A. Mason, both of Birmingham.
431,814. **Two-Part Coupling.** B. Lee, Drayton, and F. B. Bevis, Waterlooville.
431,839. **Handle Bar.** A. Fraser and H. Wardle, both of Birmingham.
431,874. **Motor Mounting.** Standard Motor Co., Ltd., and E. G. Grinham, both of Coventry.
431,876. **Coin Handler.** C. F. Gaunt, Birmingham.
431,883. **Window Cleaner.** L. Worthington, Blackpool.
431,884. **Cricket Bat Grip.** A. E. Norris, London.
431,906. **Transmitter.** H. S. Hansen, Halifax, N. S., Canada.
431,918 and 431,919. **Hose Coupling.** G. Carpenter and Electric Hose & Rubber Co., Ltd., both of London.
431,944. **Windscreen Cleaner.** C.A.V.-Bosch, Ltd., and S. F. H. Parsons, both of London.
431,969. **Tire Relief Valve.** O. W. Hosking, Monroe, N. Y., U. S. A.
431,987. **Nonconducting Covering.** E. Kagi, Wadenswil, Switzerland.
431,993. **Window Antirattler.** E. Johnston, Dublin, Irish Free State.
432,004. **Tire Deflation Indicator.** E. De S. Rideout, London.
432,034. **Hand Wheel.** W. W. Hamill, Four Oaks.
432,093. **Railway Vehicle Wheel.** L. Harter, Dresden, Germany.
432,104. **Ship's Fender.** O. J. Phillips, Bristol.
432,165. **Tennis Racket.** E. Rubant, Königinhof-on-Elbe, Czechoslovakia.
432,171. **Air Cushion.** P. Klapsia, Vienna, Austria.
432,219. **Tray.** H. G. W. Chichester-Miles, Harpenden.
432,304. **Rubber Springs.** Dunlop Rubber Co., Ltd., London, and S. Sadler, Birmingham.
432,321. **Wearing Apparel.** Brevets & Procedes Industriels (B.E.P.I.), and E. Katz, both of Paris, France.
432,498. **Pneumatic Sucker Fastening.** M. Schuler, Berlin, Germany.
432,582. **Pile Fabric.** J. Morton, Carlisle.
432,590. **Horseshoe.** A. Eichenauer, Tonisheide, Germany.
432,611. **Typewriter Roller.** W. E. Taylor, Londonderry, Ireland.
432,631. **Knob.** F. R. Jelley, Sutton.
432,645. **Sliding Clasp Fastener.** G. H. C. Corner, Birmingham, and Lightning Fasteners, Ltd., London.
432,699. **Vehicle Body.** Soc. Italiana Pirelli, Milan, Italy.
432,716. **Printing Surface.** E. S. & A. Robinson, Ltd., and T. S. Foweraker, both of Bristol.
432,775. **Battery.** L. Fuller, London.
432,842. **Surgical Syringe.** F. C. Jones, London.
432,896. **Tire Valve.** A. Schrader's Son, Inc., Brooklyn, assignee of S. T. Williams, Bellerose, both in N. Y.
432,907. **Air Mattress.** D. C. Black, Greenock.
432,908. **Refueling Aircraft in Flight.** A. J. Cobham and A. Cobham Aviation, Ltd., both of London.
432,948. **Aircraft Fuel Tank.** Caoutchouc Nouveau Soc. Anon., Seine-et-Oise, France.
432,956. **Draining Board.** L. I. Willoughby and L. Baddeley, Bradford.

(Continued on page 80)

Market Reviews

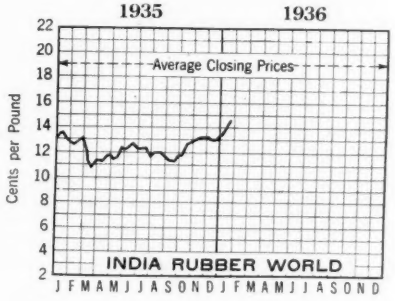
CRUDE RUBBER

New York Quotations

New York outside market rubber quotations in cents per pound

Paras	Jan. 26, 1935	Dec. 26, 1935	Jan. 27, 1936
Upriver fine	9⅛	13	13¼
Upriver fine	*12¾	*15¾	*16¾
Upriver coarse...	7	9	10¼
Upriver coarse...	*11	*12⅝	*14¾
Islands fine	8¾	13	13½
Islands fine	*12¾	*15¾	*17
Acre, Bolivian fine	9¼	13¼	13¼
Acre, Bolivian fine	*13	*15⅞	*17
Beni, Bolivian ...	9¾	13¼	13¾
Madeira fine	9⅛	13	13¼
Caucho			
Upper ball	7	9	10¼
Upper ball	*11	*12⅝	*14¾
Lower ball	6¾	8½	10
Pontianak			
Bandjermasin	6¼	6¼	6½
Pressed block ...	11	12/15	12/16
Sarawak	6½	6¼	6½
Guayule			
Duro, washed and dried	12	12	12
Ampar	13	13	13
Africans			
Rio Nuñez	12	13½	16
Black Kassai	10	13½	16
Prime Niger flake.	25	25	27
Gutta Percha			
Gutta Siak	9¾	12⅜	12
Gutta Soh	14½	13	12¾
Red Macassar ...	1.40	2.20	1.20
Balata			
Block, Ciudad Bolivar	36	30	32
Manaos block	32	27	32
Surinam sheets ..	40	35	36
Amber	43	38	40

*Washed and dried crepe. Shipments from Brazil.



New York Outside Market—Spot Ribbed Smoked Sheets

Commodity Exchange

TABULATED WEEK-END CLOSING PRICES

Futures	Nov. 30	Dec. 28	Jan. 4	Jan. 11	Jan. 18	Jan. 25
Dec. ..	13.21	.....	.....	.....	.....	.....
Jan.	13.28	13.32	13.58	14.12	14.10	14.90
Mar.	13.43	13.51	13.78	14.28	14.28	15.05
June	13.70	13.74	14.00	14.47	14.50	15.21
Sept.	13.90	13.98	14.22	14.68	14.72	15.41
Dec. ..	.....	.....	14.43	14.92	14.92	15.65
Volume per week (tons)	15,060	3,830	6,420	21,610	14,820	20,030

THE above table shows at a glance the price trend on representative futures during the last two months. A very gradual rise in the price of No. 1 smoked sheet futures throughout the last three weeks of December more than offset the sudden drop of about 40 points that resulted during the first week from the action of the I.R.R.C. in increasing the Netherland India basic quota. Trading was characteristically dull during the last week of December, and the first week of the new year was similarly affected, although to a lesser degree. Both were shortened holiday weeks.

From the outset in January prices increased consistently and in amounts that caused new highs for 1935 and 1936 during the second week and each succeeding week thereafter. The strength of factory buying, the increase in December consumption, reports of decreased exports and stocks of the producing countries, and the certainty of passage of the soldiers' bonus bill with its accompanying monetary inflationary prospects are conditions that combined to activate the market materially both in respect to volume and price.

Out of respect to the memory of King George V the commodity market deferred the opening one hour January 28, the day of His Majesty's funeral.

New York Outside Market

Heavy production schedules maintained during December caused more than the usual demand for rubber, thus maintaining spot prices for No. 1

(*Continued on page 82*)

New York Outside Market—Spot Closing Prices—Plantation Grades—Cents per Pound

	December, 1935								January, 1936														
	23	24	25*	26	27	28	30	31	1*	2	3	4	6	7	8	9	10	11	13	14	15	16	17	18
No. 1 Ribbed Smoked Sheet	13¼	13¼	..	13⅜	13⅜	13⅜	13½	13⅜	..	13½	13⅝	13⅝	13¾	13⅞	13⅞	13⅞	14	14⅛	14⅛	14⅛	14⅛	14⅛	14⅛	14¼
No. 2 Ribbed Smoked Sheet	13⅛	13⅛	..	13⅜	13¼	13¼	13⅜	13⅜	..	13⅜	13½	13½	13⅝	13¾	13⅞	13⅞	13⅞	14⅛	14⅛	14⅛	14⅜	14⅜	14¼	14⅜
No. 3 Ribbed Smoked Sheet	13	13	..	13⅛	13⅜	13⅜	13⅜	13⅜	..	13⅜	13⅜	13⅜	13⅝	13⅝	13⅞	13¾	13¾	13⅞	14	14⅛	14⅛	14⅛	14⅛	14⅛
No. 4 Ribbed Smoked Sheet	12⅝	12⅝	..	13⅛	13⅛	13⅛	13¼	13⅛	..	13¼	13⅜	13⅜	13⅜	13⅝	13¾	13⅝	13⅝	14	14	14¼	14¼	14¼	14⅛	14⅛
No. 1 Thin Latex Crepe.	13⅝	13⅝	..	13⅛	13⅛	13⅛	13⅜	13⅜	..	13⅞	14	14	14⅛	14⅜	14⅜	14¼	14⅜	14⅛	14¼	14⅝	14¾	14⅛	14⅛	14⅝
No. 1 Thick Latex Crepe ..	13⅛	13⅛	..	13½	13½	13½	13⅝	13¾	..	13⅛	13⅛	13⅜	13⅜	14	14⅛	14⅛	14⅛	14⅜	14⅜	14⅜	14⅜	14⅝	14½	14⅜
No. 1 Brown Crepe.....	13⅛	13⅛	..	13⅜	13¼	13¼	13⅜	13⅜	..	13⅜	13½	13½	13⅝	13¾	13⅞	13⅞	13⅞	14⅛	14	14	14⅛	14⅛	14⅜	14⅜
No. 2 Brown Crepe.....	13⅛	13⅛	..	13⅜	13⅜	13⅜	13⅜	13⅜	..	13⅜	13⅜	13⅜	13⅝	13⅞	13⅞	13⅞	13¾	13⅞	14	14	14⅛	14¼	14⅛	14⅜
No. 2 Amber	13⅛	13⅛	..	13⅜	13¼	13¼	13⅜	13⅜	..	13⅜	13½	13½	13⅝	13¾	13⅞	13⅞	13⅞	14⅛	14	14	14⅛	14⅛	14⅜	14⅜
No. 3 Amber	13⅛	13⅛	..	13⅜	13⅜	13⅜	13⅜	13⅜	..	13⅜	13⅜	13⅜	13⅝	13¾	13⅞	13⅞	13¾	14	14	14	14⅛	14⅛	14⅛	14⅜
No. 4 Amber	12⅝	12⅝	..	13	13⅛	13⅛	13⅛	13¼	..	13⅛	13⅜	13⅜	13½	13⅝	13⅞	13⅞	13½	13⅝	13⅝	14	14⅛	14⅛	14⅛	14⅛
Rolled Brown	12¾	12¾	..	12⅞	12⅞	12⅞	13	13⅛	..	13	13⅛	13⅛	13¼	13⅜	13⅜	13⅜	13½	13⅝	13⅝	13⅞	14	14⅛	14⅛	14

*Holiday.

New York Outside Market (Continued)

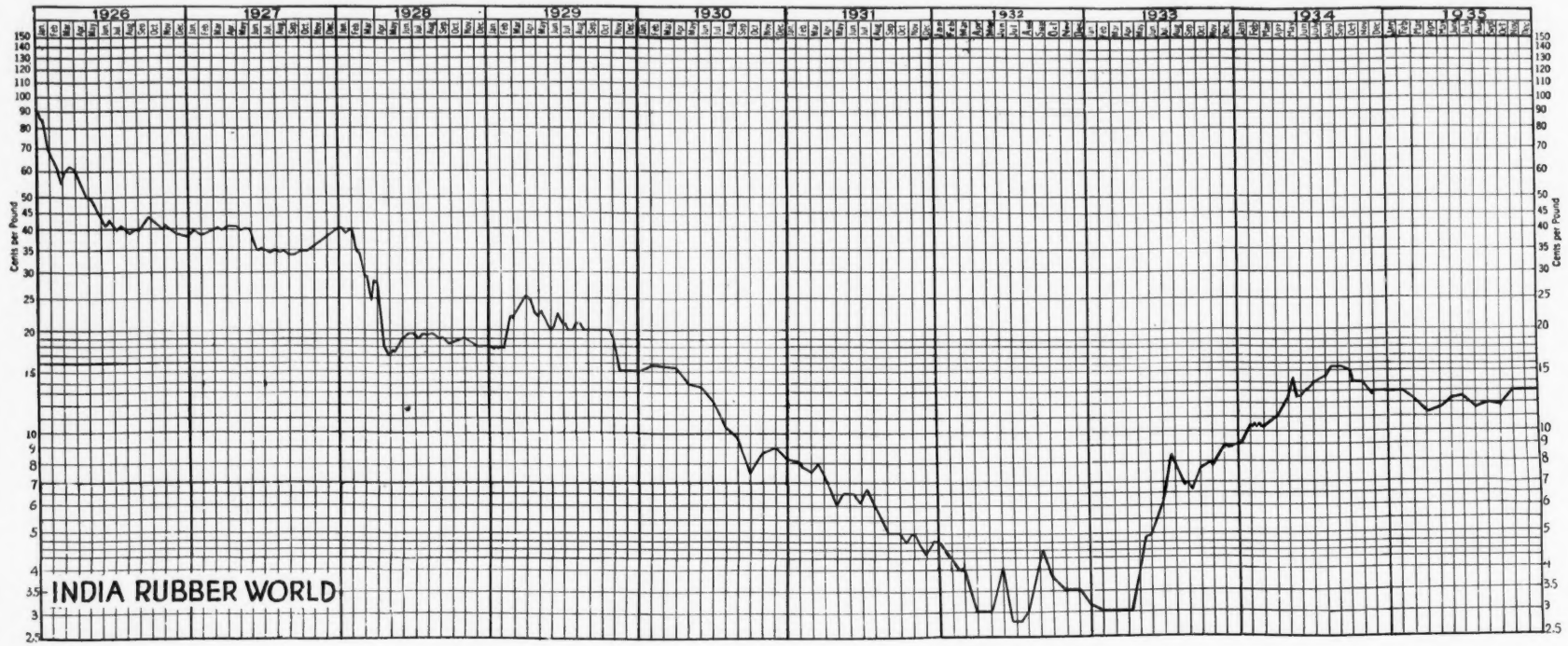
	January, 1936					
	20	21	22	23	24	25
No. 1 Ribbed Smoked Sheet	14⅜	14½	14⅝	14⅛	15	15
No. 2 Ribbed Smoked Sheet	14⅛	14⅜	14⅛	14⅝	14⅛	14⅛
No. 3 Ribbed Smoked Sheet	14¼	14⅜	14½	14⅛	14⅞	14⅞
No. 4 Ribbed Smoked Sheet	14⅛	14⅛	14⅛	14½	14⅛	14⅛
No. 1 Thin Latex Crepe	14⅜	14⅞	15	15⅛	15⅜	15⅜
No. 1 Thick Latex Crepe	14⅛	14¼	14⅛	14⅞	15½	15½
No. 1 Brown Crepe	14⅝	14⅞	14⅞	14⅝	14⅞	14⅞
No. 2 Brown Crepe	14¼	14⅜	14⅛	14⅝	14⅛	14⅛
No. 2 Amber	14⅛	14⅞	14⅞	14⅝	14⅞	14⅞
No. 3 Amber	14¼	14⅜	14½	14⅛	14⅛	14⅛
No. 4 Amber	14⅜	14⅝	14⅞	14½	14⅜	14⅜
Rolled Brown	14⅝	14⅞	14⅞	14⅜	14⅝	14⅝

U. S. Imports of Golf Balls

	United Kingdom		All Other		Total	
	No.	$	No.	$	No.	$
1932	1,442,110	334,744	9,335	1,283	1,451,445	336,027
1933	1,067,816	255,002	624	248	1,068,440	255,250
1934	456,506	110,679	984	328	457,490	111,007
1935						
June	67,344	12,085	36	12	67,380	12,097
July	102,420	17,369	369	94	102,789	17,463
August	79,340	11,285	36	12	79,376	11,297
September	32,472	5,755	...	...	32,472	5,755
October	14,208	2,253	360	45	14,568	2,298
November	8,160	1,252	...	...	8,166	1,252
1934						
November	5,940	1,082	...	...	5,940	1,082

New York Outside Market—Low and High Spot Rubber Prices in Cents per Pound—1929-1935

	January	February	March	April	May	June	July	August	September	October	November	December
1929, First latex crepe	18¼/22⅝	22 /27⅜	22¼/26½	20 /23¼	20⅛/24⅛	21⅛/22⅛	21¾/23⅛	20⅞/22⅝	20⅝/21⅜	19¼/21⅜	16½/19⅛	16¼/17⅜
Ribbed smoked sheet	18 /22⅜	21¾/26⅞	21⅝/26⅛	19½/23	19½/23⅜	20 /21½	20⅜/22½	19⅞/21⅜	19⅜/20½	18¼/20⅜	15¾/18⅛	15½/16½
Upriver fine	19½/23¾	23½/27¼	23 /27	20½/23½	21¼/24¼	21¾/23½	21¾/22½	21¼/22½	19¾/21¾	19½/20½	16½/19¼	15¾/16½
1930, No. 1 Thin latex crepe	15 /16⅝	15⅝/16⅞	15⅜/16¼	14⅜/15⅞	14⅞/14¾	12⅛/14¼	10⅞/12¾	10¼/10⅜	7¾/10¼	7⅝/ 9⅜	8⅝/ 9¾	8⅝/ 9⅞
Ribbed smoked sheet	14⅜/15¾	15 /16⅜	14⅞/15¾	14⅛/15½	13¾/14½	11¾/13¾	10⅜/12¼	9¾/10⅜	7½/ 9¾	7⅜/ 9	8¼/ 9½	8¼/ 9⅜
Upriver fine	15¾/16⅝	16¼/17	16¾/.....	15¾/16¼	15½/15¾	14¼/15¼	13¼/14¼	13¼/....	12¼/13¼	12¼/....	12¼/12½	12¼/....
1931, No 1 Thin latex crepe	8⅛/ 8⅞	7½/ 8¼	7⅛/ 8⅝	6 / 7⅛	6¼/ 7⅛	6⅜/ 7½	6¼/ 7¼	5½/ 6¼	4⅜/ 5¾	4⅜/ 5⅛	4⅝/ 5⅛	4⅝/ 5⅛
Ribbed smoked sheet	7⅞/ 8½	7¼/ 8	6⅜/ 8⅜	5⅞/ 6⅞	6 / 6⅞	6⅛/ 7	5¾/ 6¾	5⅛/ 5¾	4⅛/ 5⅜	4⅛/ 5⅜	4⅜/ 5	4⅜/ 5⅛
Upriver fine	.....	9¼/....	9 / 9⅜	8¼/ 9	8¼/ 8⅝	8⅛/ 8¼	8¼/ 8¾	7⅞/ 8⅝	6 / 7¼	6 /....	5¾/ 6¼	5½/ 5¾
1932, No. 1 Thin latex crepe	4¾/ 5⅛	4⅛/ 4⅞	4⅛/ 4⅝	3⅛/ 4¼	3⅛/ 5	3⅜/ 3⅛	3⅜/ 4	4 / 5⅛	4 / 5⅛	3⅞/ 4¼	3⅞/ 4⅛	3⅞/ 3⅜
Ribbed smoked sheet	4¼/ 4¾	3⅜/ 4¼	3 / 3⅝	2⅛/ 3⅛	2¾/ 4⅛	2⅜/ 2¼	2⅝/ 3⅛	3⅛/ 4½	3⅜/ 4⅛	3⅛/ 3⅛	3⅛/ 3⅜	3⅛/ 3⅜
Upriver fine	5½/ 5¾	5¼/ 5½	5 / 5¼	5 / 5¼	5½/ 5¾	5½/....	5½/ 5¾	5¾/ 7½	6½/ 7¼	7¼/ 7¾	7¼/ 7½	6½/ 7½
1933, No. 1 Thin latex crepe	3⅝/ 3⅞	3⅝/ 3⅛	3⅝/ 3⅞	3¾/ 5	5⅛/ 6⅞	5⅞/ 7⅛	7⅜/10½	7½/ 8¾	6½/ 7⅞	6⅝/ 8¼	6⅞/ 8½	7⅛/ 9⅛
Ribbed smoked sheet	2⅛/ 3¼	2⅞/ 3	2⅛/ 3⅛	2⅛/ 4¼	4⅛/ 6⅛	5¼/ 6⅞	6½/ 9¾	6⅝/ 7⅞	6⅝/ 8¼	6⅞/ 8	7¾/ 9⅛	8½/ 9⅛
Upriver fine	6 / 6¼	6 /....	6 /....	6 / 6½	6¼/ 8¼	7½/ 8½	8¼/11	9¾/11	8¾/ 9¾	8 / 9¼	8 / 9	9 /....
1934, No. 1 Thin latex crepe	10¼/11¾	11¼/12¼	11⅞/13¼	13⅛/15¾	14 /17⅛	14¾/16	15⅞/16⅝	16¼/17½	15¾/16¾	13¾/15½	13¾/14¼	13¼/13⅞
No. 1 Ribbed smoked sheet	8¾/10⅜	9⅛/10¾	10⅛/11⅝	11¼/13⅝	12 /15¼	12¾/14⅛	13⅛/14⅞	14⅛/15¾	14¾/15⅞	13 /14½	12⅛/13⅜	12¾/13⅛
Upriver fine	8¾/ 9	9 / 9¾	9¾/10¼	10¼/11	11 /13¼	11 /12	11¼/12	11½/11¾	10¾/11¾	10 /10¾	9¾/10	9½/ 9¾
1935, No. 1 Thin latex crepe	12¾/14⅛	13 /13¾	10⅝/12⅞	10⅞/12¼	11⅝/13	12½/13⅞	11⅛/12¾	11⅛/12⅜	11½/12¼	12 /13¾	13⅛/13⅛	13⅛/13⅛
No. 1 Ribbed smoked sheet	12⅜/13⅛	12⅝/13⅜	10⅜/12⅛	10⅛/12	11⅜/12¾	12⅛/12⅜	11¾/12⅛	11⅛/12¼	11¼/12	11¾/13½	12⅛/13⅛	12¾/13⅛
Upriver fine	9¼/ 9¾	9½/ 9¾	9 / 9½	8¾/ 9½	9¼/ 9½	9½/10½	9¼/10	9¾/10¼	9⅞/10½	10½/12¼	12 /13½	12 /13½



New York Outside Market—Closing Prices Ribbed Smoked Sheets—1926-1935

COMPOUNDING INGREDIENTS

CARBON BLACK. Sales to the rubber industry in 1935 increased approximately one-third over sales for 1934. Orders for January delivery were placed at a very satisfactory rate. It is anticipated that during the first half of 1936 the demand for black will total a very substantial increase over the same period of 1935. Contracts already placed would seem to justify expectation that consumer demand this year will run 18 to 20% over 1935. Contracts for 1936 are on the same basis as last year.

LITHARGE. Demand for this standard material rules mild, with price steady since early last October.

LITHOPONE. Shipments to the rubber industry are fairly active since the turn of the year.

RUBBER CHEMICALS. Since the first of the year, two new rubber chemicals have become available to compounders. These are "El-Sixty," an accelerator for general use, and "Perflectol," an antioxidant for better aging, flexing, and appearance of rubber products.

RUBBER SOLVENTS. Following the year-end inventory period of dullness, a broad demand has set in from the tire and proofing divisions.

TITANIUM PIGMENTS. The year just closed was a record consumption one for titanium pigments, leading up to an equally promising demand for 1936. Contracts for the first six months of 1936 are made on the basis of last year.

ZINC OXIDE. The market situation with respect to zinc oxides in the rubber trade is unchanged from one month ago. Contracts have been written for the first six months of 1936 on the same quantity basis as for the last half of 1935. The majority of producers are believed to be showing a considerable loss. This applies to all the producers of the secondary oxides except those that are making them in small quantities as a by-product from the dyestuffs industries. In view of this situation it is probable that higher prices are to be expected, and no doubt will be moderate in order not to encourage trade complications.

New York Quotations

January 27, 1936

Prices Not Reported Will Be Supplied on Application

Abrasives		
Pumicestone, powdered	lb.	$0.02 /$0.03½
Rottenstone, domestic	lb.	.03 / .03½
Silica, 15	ton	38.00
Accelerators, Inorganic		
Lime, hydrated	ton	20.00
Litharge (commercial)	lb.	.06½/ .07
Magnesia, calcined, heavy	lb.	.04
carbonate	lb.	.06½/ .07
Accelerators, Organic		
A-1	lb.	.21 / .25
A-5-10	lb.	.33 / .36
A-10	lb.	
A-11	lb.	.60 / .75
A-16	lb.	.55 / .65
A-19	lb.	.56 / .75
A-32	lb.	.70 / .80
A-77	lb.	
Accelerator 49	lb.	
85	lb.	
87	lb.	
122	lb.	
552	lb.	
808	lb.	
833	lb.	
Acrin	lb.	
Aldehyde ammonia	lb.	
Altax	lb.	
Beutene	lb.	
Butyl Zimate	lb.	
C-P-B	lb.	
Captax	lb.	
Crylene	lb	
Paste	lb.	
D-B-A	lb.	
Di-Esterex	lb.	
Di-Esterex-N	lb.	
DOTG	lb.	
D.O.T.T.U.	lb.	
DPG	lb.	
El-Sixty	lb.	
Ethylideneaniline	lb.	
Formaldehyde P.A.C.	lb.	
Formaldehydeaniline	lb.	
Formaldehyde-para-toluidine	lb.	
Guantal	lb.	.42 / .51
Hepteen	lb.	
Base	lb.	
Hexamethylenetetramine	lb.	
Lead oleate, No. 999	lb.	.11
Witco	lb.	.11
Methylenedianilide	lb.	
Monex	lb.	
Novex	lb.	
Ovac	lb.	
Pipsolene	lb.	
R-2	lb.	1.50 / 1.90
Base	lb.	4.55 / 5.00
R & H 50-D	lb.	
Safex	lb.	
Super-sulphur No. 1	lb.	
No. 2	lb.	
Tepidone	lb.	
Tetrone A	lb.	
Thiocarbanilide	lb.	
Thionex	lb.	
Trimene	lb.	
Base	lb.	
Triphenyl guanidine (TPG)	lb.	
Tuads	lb.	
Ureka	lb.	$0.62 /$1.00
Blend B	lb.	
C	lb.	.58 / .69
Vulcanex	lb.	
Vulcanol	lb.	
Vulcone	lb.	
Z-B-X	lb.	
Z-88-P	lb.	.48 / .60
Zenite	lb.	
A	lb.	
B	lb.	
Zimate	lb.	
Activator		
Barak	lb.	
Age Resisters		
Age-Rite Gel	lb.	
HP	lb.	
Powder	lb.	
Resin	lb.	
Syrup	lb.	
White	lb.	
Akroflex A	lb.	
B	lb.	
C	lb.	
Albasan	lb.	
Antox	lb.	
A-V-A-R	lb.	
B-L-E	lb.	
Flectol B	lb.	
H	lb.	
White	lb.	
M-U-F	lb.	
Neozone (standard)	lb.	
A	lb.	
C	lb.	
D	lb.	
E	lb.	
Oxynone	lb.	
Parazone	lb.	
Perflectol	lb.	
Permalux	lb.	
Solux	lb.	
Thermoflex	lb.	
A	lb.	
V-G-B	lb.	
Alkalies		
Caustic soda, flake, Columbia (400 lb. drums)	100 lbs.	3.00 / 4.00
liquid, 50%	100 lbs.	2.25
solid (700 lb. drums)	100 lbs.	2.60 / 3.60
Antiscorch Materials		
Antiscorch T	lb.	
Cumar RH	lb.	.09
Retarder B	lb.	
W	lb.	
T-J-B	lb.	
U.T.B.	lb.	
Antisun Materials		
Heliozone	lb.	
Sunproof	lb.	
Brake Lining Saturant		
B. R. T. No. 3	lb.	$0.016 /$0.018
Colors		
BLACK		
Lampblack (commercial)	lb.	.15
BLUE		
Brilliant	lb.	
Prussian	lb.	
Toners	lb.	.80 / 3.50
BROWN		
Mapico	lb.	.13
GREEN		
Brilliant	lb.	
Chrome, light	lb.	
medium	lb.	
oxide	lb.	.18½/ .23½
Dark	lb.	
Guignet's	lb.	.70
Light	lb.	
Toners	lb.	.85 / 3.50
ORANGE		
Lake	lb.	
Toners	lb.	.40 / 1.60
ORCHID		
Toners	lb.	1.50 / 2.00
PINK		
Toners	lb.	1.50 / 4.00
PURPLE		
Permanent	lb.	
Toners	lb.	.60 / 2.00
RED		
Antimony		
Crimson, 15/17%	lb.	
R. M. P. No. 3	lb.	.46
Sulphur free	lb.	.48
Golden 15/17%	lb.	
7-A	lb.	.33
Z-2	lb.	.22
Aristi	lb.	
Cadmium, light (400 lb. bbls.)	lb.	.70
Chinese	lb.	
Crimson	lb.	
Mapico	lb.	
Medium	lb.	
Rub-Er-Red	lb.	.09¼
Scarlet	lb.	
Toners	lb.	.80 / 2.00
WHITE		
Lithopone (bags)	lb.	.04½/ .04¾
Albalith Black Label-11	lb.	.04½/ .04¾
Astrolith (5-ton lots)	lb.	.04½
Azolith	lb.	.04½/ .04¾
Cryptone-19	lb.	.06 / .06¼
CB-21	lb.	.06 / .06¼
ZS No. 20	lb.	.10½/ .10¾
No. 86	lb.	.10½/ .10¾
Sunolith (5-ton lots)	lb.	.04½
Ray-Bar	lb.	

Ray-Cal	lb.	
Rayox	lb.	
Titanolith (5-ton lots)	lb.	$0.06
Titanox-A (50-lb. bags)	lb.	.17 /$0.18½
B (50-lb. bags)	lb.	.06 / .06¼
C (50-lb. bags)	lb.	.06 / .06¼
Ti-Tone	lb.	
Zinc Oxide		
Anaconda, Green Seal No. 333	lb.	.06 / .06¾
Lead Free No. 352	lb.	.05 / .05¼
No. 570	lb.	.05 / .05¼
No. 577	lb.	.05 / .05¼
Red Seal No. 222	lb.	.05½/ .05¾
U.S.P. No. 777 (bbls)	lb.	.08
White Seal No. 555	lb.	.06¾/ .06¾
Azo ZZZ-11	lb.	.05 / .05¼
44	lb.	.05 / .05¼
55	lb.	.05 / .05¼
66	lb.	.05 / .05¼
French Process, Florence White Seal-7 (bbls.)	lb.	.06½/ .06¾
Green Seal-8	lb.	.06 / .06¼
Red Seal-9	lb.	.05½/ .05¾
Kadox, Black Label-15	lb.	.05 / .05¼
Blue Label-16	lb.	.05 / .05¼
Red Label-17	lb.	.05 / .05¼
Horse Head Special 3	lb.	.05 / .05¼
XX Red-4	lb.	.05 / .05¼
23	lb.	.05 / .05¼
72	lb.	.05 / .05¼
78	lb.	.05 / .05¼
80	lb.	.05 / .05¼
103	lb.	.05 / .05¼
110	lb.	.05 / .05¼
St. Joe (lead free) Black Label No. 20	lb.	.05 / .05¼
Green Label No. 42	lb.	.05 / .05¼
Red Label No. 30	lb.	.05 / .05¼
U.S.P. X	lb.	.08 / .08¼

YELLOW

Cadmolith (cadmium yellow)	lb.	.45 / .50
Lemon	lb.	
Mapico	lb.	.09½
Toners	lb.	2.50

Dispersing Agents

Bardol	lb.	.021 / .023
Darvan	lb.	

Factice—See Rubber Substitutes

Fillers, Inert

Asbestine, c.l., f.o.b. mills	ton	15.00
Barytes	ton	30.00
f.o.b St. Louis (50 lb. paper bags)	ton	22.85
off color, domestic	ton	20.00 /25.00
white, imported	ton	29.00 /32.00
Calcene, c.l.	ton	37.50
Infusorial earth	lb.	.02 / .03
Kalite No. 1	ton	
No. 3	ton	
Whiting		
Columbia Filler	ton	9.00 /14.00
Domestic	100 lbs.	
Guilders	100 lbs.	
Hakuenka	lb.	
Paris white, English cliff-stone	100 lbs.	
Southwark Brand, Commercial	100 lbs.	
All other grades	100 lbs.	
Suprex, white, extra light	ton	45.40 /60.00
heavy	ton	45.40 /60.00
Witco, c.l.	ton	7.00

Fillers for Pliability

Fumonex, c.l., f.o.b. works	lb.	.03
ex-warehouse	lb.	.04½
P-33	lb.	
Thermax	lb.	
Velvetex	lb.	.03 / .04½

Finishes

IVCO lacquer, clear	gal.	
colors	gal.	
Rubber lacquer, clear	gal.	
colored	gal.	
Starch, corn, pwd	100 lbs.	
potato	lb.	
Talc	ton	25.00 /45.00
Dusting	ton	
Pyrax	ton	

Flock

Cotton flock, dark	lb.	.11 / .13
dyed	lb.	.50 / .85
white	lb.	.14½/ .20
Rayon flock, colored	lb.	1.25 / 1.60
white	lb.	1.10

Latex Compounding Ingredients

Alphasol-OS	lb.	
Antox, dispersed	lb.	
Aquarex D	lb.	
F	lb.	
Aresklene	lb.	
Catalpo	ton	
Color pastes, dispersed	lb.	
Dispersaid	lb.	1.50
Dispersex 15	lb.	.95
20	lb.	.75
Emo, brown	lb.	.13
white	lb.	.13
Factice Compound, dispersed	lb.	.30
Heliozone, Dispersed	lb.	
Igepon A	lb.	
Micronex, Colloidal (75 lbs.)	lb.	$0.11
320 lbs.	lb.	.08
Nekal BX (dry)	lb.	
Palmol	lb.	.10
Paradors	lb.	
Stablex A	lb.	1.75
B	lb.	.90
C	lb.	.30
Sulphur, Colloidal	lb.	
Vulcan Colors	lb.	
Zinc oxide, Colloidal	lb.	

Mineral Rubber

B. R. C. No. 20	lb.	.0125/$0.014
Black Diamond	ton	25.00
Genasco Hydrocarbon, granulated, (fact'y)	ton	
solid	ton	
Gilsonite Hydrocarbon (factory)	ton	
Hydrocarbon, hard	ton	
soft	ton	
Parmr Grade 1, l.c.l.	ton	31.00
Grade 2	ton	31.00
Pioneer	ton	
265°	ton	

Mold Lubricants

Mold Paste No 1	lb.	
Rusco mold paste	lb.	.12 / .30
Sericite	ton	65.00 /70.00
Soapbark	lb.	
Soapstone	ton	25.00 /35.00

Oil Resistant

AXF	lb.	

Reclaiming Oils

B. R. V.	lb.	.039 / .041
S. R. O.	lb.	.015 / .019

Reenforcers

Carbon Black		
Aerfloted Arrow Specification Black	lb.	.0535/ .0825
Arrow Compact Granualized Carbon Black	lb.	
"Certified" Spheron, Cabot	lb.	
Disperso (delivered)	lb.	.0445/ .0535
Dixie, c.l., f.o.b. New Orleans, La., Galveston or Houston, Tex.	lb.	.0445
c.l., delivered New York	lb.	.0535
local stock delivered	lb.	.07 / .08¼
Dixiedensed, c.l, f.o.b. New Orleans, La., Galveston or Houston, Tex.	lb.	.0445
c.l., delivered New York	lb.	.0535
local stock delivered	lb.	.07 / .08¼
Excello, c.l., f.o.b Gulf ports	lb.	.0445/ .0645
delivered New York	lb.	.0535/ .0735
l.c.l., delivered New York	lb.	.07 / .08¼
Gastex	lb.	.03 / .07
Kosmobile, c.l., f.o.b New Orleans, La., Galveston or Houston, Tex.	lb.	.0445
c.l., delivered New York	lb.	.0535
local stock delivered	lb.	.07 / .08¼
Kosmos, c.l., f.o.b. New Orleans, La., Galveston or Houston, Tex.	lb.	.0445
c.l., delivered New York	lb.	.0535
local stock delivered	lb.	.07 / .08¼
Micronex Beads	lb.	
Mark II	lb.	
Standard	lb.	
W-5	lb.	
W-6	lb.	
Pelletex	lb.	.03 / .07
Supreme, c.l., f.o.b. Gulf ports	lb.	.0445/ .0645
delivered New York	lb.	.0535/ .0735
l.c.l., delivered New York	lb.	.07 / .08¼
Carbonex	lb.	.030 / .0375
Carbonex "S"	lb.	.0315/ .040
Clays		
Aerfloted Paragon	ton	8.50
Suprex No. 1 Selected	ton	10.00
No. 2 Standard	ton	8.50
Dixie	ton	
Junior	ton	
McNamee	ton	
Par	ton	
Witco	ton	8.50
Cumar EX	lb.	.04

Reodorants

Amora A	lb.	
B	lb.	
C	lb.	
D	lb.	
Paradors	lbs.	
Rodo No. 0	lb.	
No. 10	lb.	

Rubber Substitutes or Factice

Amberex	lb.	.26
Black	lb.	.07 / .11
Brown	lb.	.08 / .14
Duphax A	lb.	.11
B	lb.	.11
Fac-Cel B	lb.	.13
C	lb.	.13
White	lb.	.08 / .14

Softeners

Burgundy pitch	lb.	$0.05
Cycline oil	gal.	.15 /$0.28
Palm oil (Witco)	lb.	.05½
Petrolatum, light amber	lb.	.03½
Pine tar	gal.	
Plastogen	lb.	
Reogen	lb.	
Rosin oil, compounded	gal.	.40
R.P.A. No. 1	lb.	
Rubtack	lb.	.10
Tacko:	lb.	.085 / .15
Tonox	lb.	
Powder	lb.	
Witco No. 20	gal.	.15

Softeners for Hard Rubber Compounding

RSL Resin	lb.	
Resin C Pitch 55° C. M.P.	lb.	.0125/ .0145
Resin C Pitch 70° C. M.P.	lb.	.0125/ .0145
Resin C Pitch 85° C. M.P.	lb.	.0125/ .0145

Solvents

Beta-Trichlorethane	gal.	
Bondogen	lb.	
Carbon bisulphide	lb.	
tetrachloride	lb.	

Stabilizers for Cure

Laurex, ton lots	lb.	
Stearex B	lb.	.10¾/ .11¾
Beads	lb.	.086
Stearic acid, single pressed	lb.	.11 / .13
Stearite	lb.	.08
Zinc stearate	lb.	.22

Synthetic Rubber

"DuPrene"[1] Latex Type 50	gal.	
Type D	lb.	
"Thiokol" A (f.o.b. Yardville)	lb.	.35
Coating Materials	gal.	3.50 / 6.50
D	lb.	.75
Molding Powder	lb.	.75

Tackifier

B. R. H. No. 2	lb.	.015 / .020

Varnish

Shoe	gal.	1.45

Vulcanizing Ingredients

Sulphur		
Chloride, drums	lb.	.03½/ .04
Rubber	100 lbs.	
Telloy	lb.	
Vandex	lb.	

(See also Colors—Antimony)

Waxes

Carnauba, No. 3 chalky	lb.	
2 N.C.	lb.	
3 N.C.	lb.	
1 Yellow	lb.	
2	lb.	
Montan, crude	lb.	

[1] Trade mark registered.

British Malaya

An official cable from Singapore to the Malayan Information Agency, Malaya House, 57 Charing Cross, London, S.W.1, England, gives the following figures for December, 1935:

Rubber Exports: Ocean shipments from Singapore, Penang, Malacca, and Port Swettenham

	December, 1935	
To	Sheet and Crepe Rubber Tons	Latex, Concentrated Latex, Revertex, and Other Forms of Latex Tons
United Kingdom	6,352	151
United States	19,042	548
Continent of Europe	5,915	442
British possessions	1,950	62
Japan	2,498	52
Other countries	817	9
Totals	36,574	1,264

Rubber Imports: Actual, by Land and Sea

	December, 1935	
From	Dry Rubber Tons	Wet Rubber (Dry Weight) Tons
Sumatra	1,393	123
Dutch Borneo	647	4
Java and other Dutch islands	200	1
Sarawak	1,087	135
British Borneo	185	6
Burma	714	32
Siam	1,809	926
French Indo-China	36	102
Other countries	121	8
Totals	6,192	1,337

COTTON AND FABRICS

NEW YORK COTTON EXCHANGE WEEK-END CLOSING PRICES

	Nov. 30	Dec. 28	Jan. 4	Jan. 11	Jan. 18	Jan. 25
Futures						
Dec. ..	11.74	.....	.....	.....	.....	.....
Jan. ..	.....	11.40	11.68	11.79	11.69	11.86
Mar. .	11.53	11.24	11.32	11.16	11.32	11.41
July ..	11.26	10.92	10.85	10.52	10.65	10.90
Sept. .	11.12	10.70	10.63	10.24	10.31	10.62
Dec. ..	.....	10.58	10.51	10.04	10.10	10.45

New York Quotations

January 27, 1936

Drills

38-inch 2.00-yard .....yd.	$0.14⅛
40-inch 3.47-yard	.08½
50-inch 1.52-yard	.19⅞
52-inch 1.85-yard	.16⅝
52-inch 1.90-yard	.14⅝
52-inch 2.20-yard	.13¼
52-inch 2.50-yard	.12¾
59-inch 1.85-yard	.15

Ducks

38-inch 2.00-yard D. F.....yd.	.15
40-inch 1.45-yard S. F.....	.20½
51¼-inch 1.35-yard D. F.....	.21½
72-inch 1.05-yard D. F.....	$0.30/.30¾
72-inch 17.21-ounce	.34¾

MECHANICALS

Hose and belting.....lb.	.31¾

TENNIS

52-inch 1.35-yard .....yd.	.21¼

***Hollands**

GOLD SEAL

20-inch No. 72 .....yd.	.09
30-inch No. 72	.17¼
40-inch No. 72	.18

RED SEAL

20-inch .....yd.	.08¼
30-inch	.15¾
40-inch	.16½
50-inch	.21

Osnaburgs

40-inch 2.34-yard .....yd.	.10¾/.12¼
40-inch 2.48-yard	.10¾/.11½
40-inch 2.56-yard	.10
40-inch 3.00-yard	.09½
40-inch 7-ounce part waste.....	.10¾
40-inch 10-ounce part waste.....	.15½
37-inch 2.42-yard	.11¾

Raincoat Fabrics

COTTON

Bombazine 60 x 64.....yd.	.08½
Plaids 60 x 48.....	.10½
Surface prints 60 x 64.....	.11¼
Print cloth, 38½-inch, 60 x 64...	.05⅝

SHEETINGS, 40-INCH

48 x 64, 2.50-yard.....yd.	.09¼
64 x 68, 3.15-yard.....	.08⅞
56 x 60, 3.60-yard	.07⅞
44 x 48, 3.75-yard.....	.06⅞

SHEETINGS, 36-INCH

48 x 64, 2.50-yard.....yd.	.05⅜
44 x 40, 6.15-yard.....	.04½

Tire Fabrics

BUILDER

17¼ ounce 60" 23/11 ply Karded peeler .....lb.	.36

CHAFER

14 ounce 60" 20/8 ply Karded peeler .....lb.	.36
9¼ ounce 60" 10/2 ply Karded peeler .....lb.	.34

CORD FABRICS

23/5/3 Karded peeler, 1/16" cotton .....lb.	.36
15/3/3 Karded peeler, 1/16" cotton .....lb.	.34
23/5/3 Karded peeler, 1¼" cotton .....lb.	.40
23/5/3 Combed Egyptian .....lb.	.52

LENO BREAKER

8¼ ounce and 10¼ ounce 60" Karded peeler .....lb.	.36

*For less than 1,000 yards of a width add 10% to given prices.

THE table that gives week-end closing prices reveals the general trend for approximately the last two months. The frequent and fairly wide fluctuation of prices that characterized the see-sawing cotton market during December carried through January to an even more exaggerated extent.

While traders were fearful during December as to what action the Supreme Court might take in the Hoosac Mills, Moor, Talmage, and other cases affecting the Administration's cotton program, they were faced with still greater uncertainties after the entire AAA structure had been declared unconstitutional January 6, and the Moor case dismissed January 13. Not only were processing taxes thrown out by the former decision, but the crop control program was disqualified as well. Lack of knowledge of whether loans will be extended against the new crop caused the distant future contracts to be in small demand, with a consequent wide disparity of price as against near months, which were controlled by virtue of the Government pool being long on about 80,000 bales of January at 11.80¢, also 200,000 bales of March and 300,000 of May. It seemed evident that the Government planned to insist on January delivery or force the price to its buying figure or above.

Passage of the bonus bill with its inflationary implications offset the mass of disconcerting influences to cause an upturn of prices as the week ended January 25.

The New York Cotton Exchange closed the afternoon session of January 21 as a mark of respect to the memory of King George V of Great Britain.

Cotton Fabrics

The special fabric market is temporarily quiet owing to the Supreme Court decision on January 6 outlawing the processing tax levied on cotton fabrics under the AAA. Tax adjustments applicable to shipments made previous to January 6 are in process of settlement. As soon as these are completed, an excellent market is expected, stimulated by the low prices now in effect.

New Jersey

(*Continued from page* 54)

Puritan Rubber Co., Trenton, finds business holding up fairly well for this time of year.

Acme Rubber Mfg. Co., Trenton, reports business remains the same. Company officials believe conditions will greatly improve in the early spring.

Mercer Rubber Co., Hamilton Square, states business has improved the past few weeks.

John Royle & Sons, Paterson, has gained renown for the quality, durability, and performance of its extruding machines and accessories owing to the fact that in its products the firm always stresses quality and not cheapness.

Essex Rubber Co., Trenton, is running normally. Lawrence M. Oakley, company executive, was on a business trip through the New England territory.

The Thermoid Co., Trenton, continues using three shifts. Future prospects seem good.

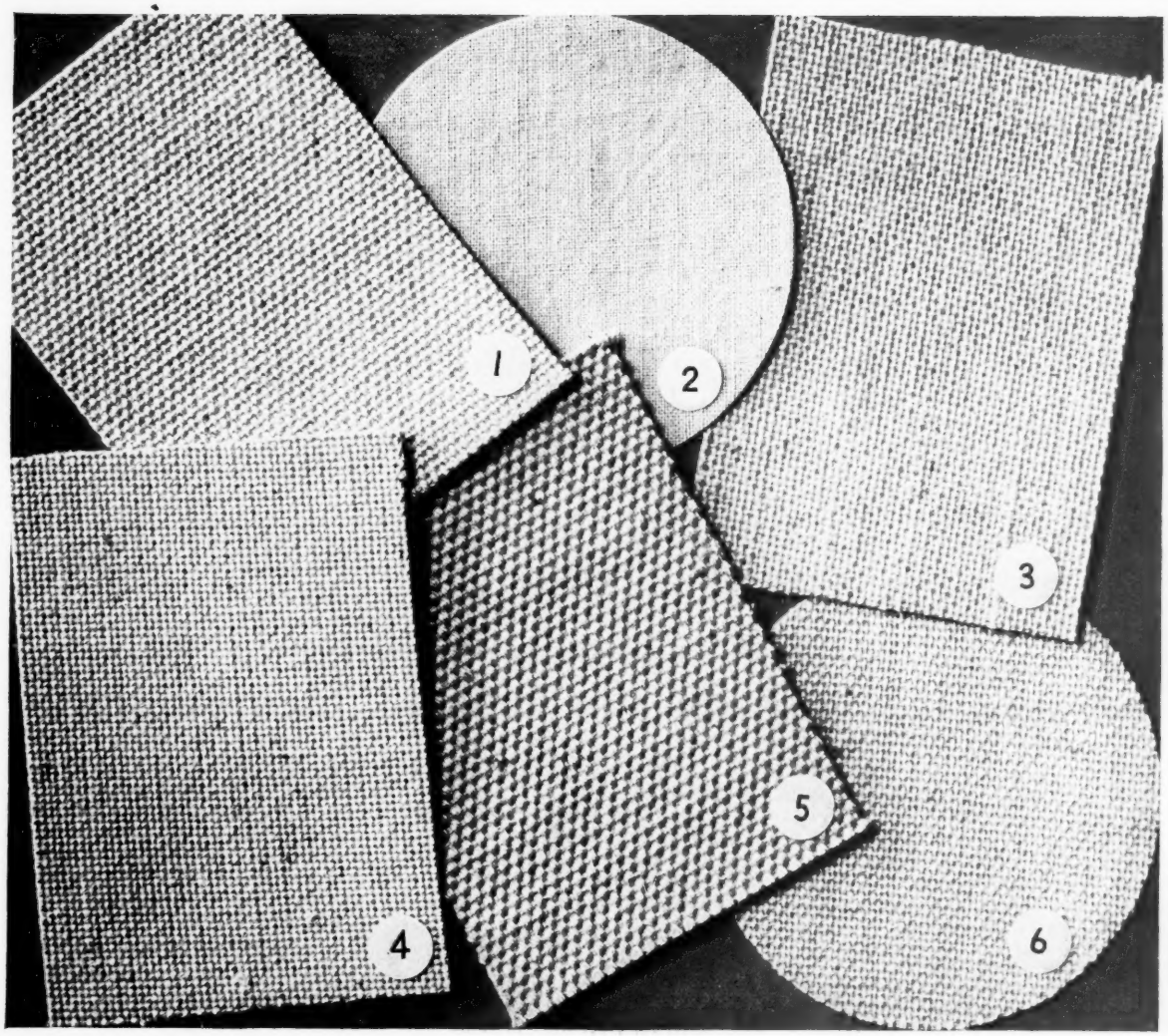
Thermoid launched its 1936 sales campaign in Maine at a dinner meeting of thirty State distributers of its products in the Lafayette Hotel, Portland, January 3. Charles A. Klaus, chief sales engineer from Trenton, presided and was the principal speaker. He was followed by F. G. Leland, of Boston, sales supervisor for New England, and S. S. Tower, of Boston, district manager. Thermoid, whose chief product is a certified brake lining set, is carrying through on its highway safety campaign begun last year, Mr. Klaus told the dealers. The chief slogan of this campaign is "Rely on Your Brakes Instead of Your Horn."

Luzerne Rubber Co., Trenton, experiencing a slight increase in hard rubber production, is encouraged over the spring outlook.

Whitehead Bros. Rubber Co., Trenton, announced that December production was the best the concern had for some time. The shoe department at present is operating under normal conditions.

Murray Rubber Co., Trenton, recently sold to Max Kalter, of New York, for $340,000, continues to operate in Trenton. I. Tachna, of New York, now in charge of production, is president and general manager of the new corporation. The City of Trenton collected back taxes of $52,000 from the company. A suit for $16,907 has been filed in Mercer Court against C. Edward Murray, Jr., former Murray president, by the Murray Rubber Products Co., new owner of the firm. The accounts purport to be a schedule of merchandise and services rendered by the former Murray company executive and chargeable to his personal account. Mr. Murray, now vice president of the Crescent Insulated Wire & Cable Co., Trenton, denies he owes anything to the company. The firm says it was assigned the claim by Alfred H. Branham, Murray receiver. Mr. Murray resigned as president of the company in April, 1930, being the last of the founder's family to break off with the business. Company reverses developed several years before when a large tire contract with a national distributing house was cancelled.

Pierce-Roberts Rubber Co, Trenton, has announced that no change in its production schedule has been made to date.



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With many years of experience in working with the engineers and purchasing agents of the leading rubber companies, we are in position to supply both standard and special fabrics to suit your particular needs.

Seventeen mills and adequate engineering and laboratory facilities assure you of technical excellence and ultimate economy.

The fabrics illustrated above are identified by number in the next column.

1. *COLUMBUS Sheeting*
2. *WEST POINT Osnaburg*
3. *SHAWMUT Belting Duck*
4. *WEST POINT Chafer Fabric*
5. *SHAWMUT Hose Duck*

Our 538-page Handbook of Industrial Fabrics gives a very complete description of cotton, cotton manufacturing processes, uses for industrial fabrics, laboratory test methods, specifications, etc. Price $2.00. One copy free to any well-rated rubber manufacturer in the United States, upon request on company letterhead.

WELLINGTON SEARS COMPANY

65 WORTH STREET NEW YORK

RECLAIMED RUBBER

United States Reclaimed Rubber Statistics—Long Tons

Year	Production	Consumption	Consumption % to Crude	U. S. Stocks*	Exports
1933	99,974	81,612	20.1	20,746	3,583
1934	110,010	100,597	22.3	23,079	4,737
1935					
January	10,465	11,261	23.9	22,291	517
February	10,072	9,374	21.7	22,989	532
March	9,741	10,549	24.8	20,637	310
April	10,315	10,466	23.4	20,521	476
May	10,223	9,938	23.9	18,541	402
June	8,590	8,710	23.8	17,932	283
July	8,421	8,396	23.1	17,810	384
August	9,557	8,795	22.4	18,272	320
September	9,041	8,774	23.4	18,260	442
October	11,926	9,662	22.8	19,640	579
November	11,482	9,084	21.2	21,478	586
December	12,307	8,521	19.8	25,069	...

*Stocks on hand the last of the month or year.
Compiled by The Rubber Manufacturers Association, Inc.

THE demand for reclaimed rubber was less active than usual in January, although of fair proportions. Dealers expect consumption for February to be similarly maintained, but hope for a distinct pick-up in March that will continue until June.

Current price quotations are unchanged from those reported December 26, 1935.

Attention is called to the high price of No. 1 Floating Tube reclaim. This is due to the scarcity of scrap of that grade which does not exceed 5% in mixed tubes as collected.

New York Quotations

January 27, 1936

	Sp. Grav.	¢ per lb.
Auto Tire		
Black Select	1.16-1.18	5 / 5¼
Acid	1.18-1.22	6 / 6¼
Shoe		
Standard	1.56-1.60	6 / 6¼
Tube		
No. 1 Floating	1.00	14 /14¼
Compounded	1.10-1.12	7 / 7¼
Red Tube	1.15-1.30	6½/ 7¼
Miscellaneous		
Mechanical Blends	1.25-1.50	3½/ 4¼
White	1.35-1.50	8 / 9¼

The above list includes those items or classes only that determine the price basis of all derivative reclaim grades. Every manufacturer produces a variety of special reclaims in each general group separately featuring characteristic properties of quality, workability, and gravity at special prices.

IMPORTS, CONSUMPTION, AND STOCKS

CRUDE rubber consumption by United States manufacturers for 1935 was approximately 497,150 long tons, the highest on record since the inception of the rubber industry, compared with 453,223 long tons consumed during 1934 and 401,000 long tons in 1933, according to R.M.A. statistics. The previous record established was in 1929, 467,400 long tons.

December consumption is estimated at 42,942 long tons, an all-time high for this month, against 42,778 long tons for November, 1935, and 36,569 long tons for December, 1934.

Crude rubber imports for 1935 were 448,116 long tons, against 469,484 long tons imported during 1934 and 411,615 long tons during 1933. December, 1935, crude rubber imports totaled 34,596 long tons, compared with 28,826 long tons for November and 29,200 long tons for December, 1934.

The estimated total domestic stocks of crude rubber on hand December 31 were 295,438 long tons, against 303,162 long tons on hand November 30 and 355,000 long tons on hand December 31, 1934.

Crude rubber afloat to United States ports on December 31 was 39,094 long tons, compared with 46,588 long tons afloat on November 30 and 47,644 long tons afloat on December 31, 1934.

London and Liverpool Stocks

Week Ended	Tons	
	London	Liverpool
Dec. 28	87,097	77,452
Jan. 4	86,061	77,513
Jan. 11	84,463	77,550
Jan. 18	84,388	77,059
Jan. 25	84,414	77,293

United States and World Statistics of Rubber Imports, Exports, Consumption, and Stocks

Twelve Months	U. S. Imports* Tons	U. S. Consumption Tons	U. S. Stocks Mfgrs., Importers, Dealers, Etc.† Tons	U. S. Stocks Afloat† Tons	U. K.— Public Warehouses, London, Liverpool‡‡ Tons	Singapore and Penang Dealers and Port Stocks†‡ Tons	World Production (Net Exports)‡ Tons	World Consumption Estimated‡ Tons	World Stocks†‡‖ Tons
1933	411,615	401,000	365,000	55,606	86,505	44,884	853,100	798,900	616,370
1934	469,484	453,223	355,000	47,644	134,927	62,142	1,016,715	959,556	678,994
1935									
January	42,059	47,103	346,084	42,066	148,337	59,609	79,502	89,216	671,954
February	35,383	43,187	337,332	42,969	155,727	57,586	75,325	90,494	657,717
March	44,041	42,620	338,700	44,485	162,012	55,100	66,671	88,112	652,659
April	43,545	44,714	334,954	37,651	165,064	48,827	76,534	80,261	652,471
May	26,866	41,568	319,281	44,375	167,745	54,740	77,940	71,543	649,991
June	38,340	36,623	320,470	55,581	171,303	51,770	74,744	66,043	648,579
July	46,880	36,384	330,528	49,018	174,227	49,958	71,510	79,719	655,154
August	38,665	39,242	329,548	47,724	177,250	46,482	77,565	80,620	659,851
September	34,569	37,553	326,236	43,413	174,894¶	33,872	74,671	71,290	640,675
October	34,356	42,436	317,850	49,913	168,570	37,597	74,449	70,844	627,363
November	28,826	42,778	303,162	46,588	166,896	32,597	64,334	.....	595,717
December	34,596	42,942	295,438	39,094	.....	.....	.....	.....	.....

*Including liquid latex. †Stocks on hand the last of the month or year. ‡Statistical Bulletin of the International Rubber Regulation Committee. ‖Stocks at U. S. A., U. K., Singapore and Penang, Para, Manaos, and afloat. ¶Including an adjustment of 2,650 tons for loss by fire at Colonial Wharf.

RUBBER SCRAP

THE demand for rubber scrap has not exceeded seasonal proportions except in the case of that for inner tubes. For those grades the demand in January was exceptionally active at higher prices. In fact, tube scrap grades are the only items of the list quoted higher than one month ago.

CONSUMERS' BUYING PRICES

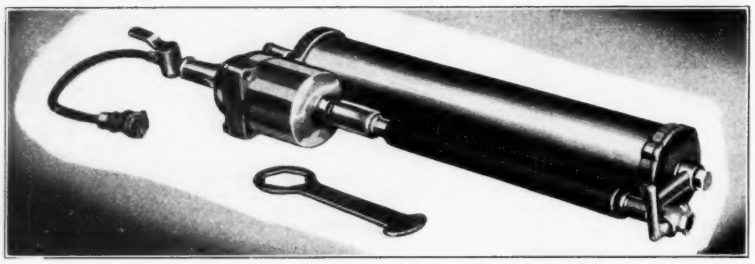
(Carload Lots Delivered Eastern Mills)

January 27, 1936

		Prices
Boots and Shoes		
Boots and shoes, black	lb.	$0.01 /$0.01¼
Colored	lb.	.00¾/ .00⅞
Untrimmed arctics	lb.	.00¾/ .00⅞
Inner Tubes		
No. 1, floating	lb.	.08½/ .09
No. 2, compound	lb.	.03⅝/ .03¾
Red	lb.	.03½/ .03⅝
Mixed tubes	lb.	.03¼/ .03⅜
Tires (Akron District)		
Pneumatic Standard		
Mixed auto tires with beads	ton	7.50 / 8.00
Beadless	ton	11.75 /12.00
Auto tire carcass	ton	9.50 /10.00
Black auto peelings	ton	16.00 /17.00
Solid		
Clean mixed truck	ton	35.00 /36.00
Light gravity	ton	38.00 /39.00
Mechanicals		
Mixed black scrap	ton	15.00 /17.00
Hose, air brake	ton	14.00 /15.00
Garden, rubber covered	ton	13.00 /13.50
Steam and water, soft	ton	13.00 /13.50
No. 1 red	lb.	.02¾/ .02¾
No. 2 red	lb.	.01½/ .01¾
White druggists' sundries	lb.	.02¾/ .03
Mechanical	lb.	.02 / .02¼
Hard Rubber		
No. 1 hard rubber	lb.	.11¼/ .11½

BUT ONE SMALL RUBBER MANUFACTURING plant is in Guatemala, employing four to twelve piece workers, producing 50 to 100 pairs of rubber heels daily. Guatemalan crude rubber imports in last five years follow: 1930, 659 kilos; 1931, 895; 1932, 229; 1933, 368; 1934, 171 kilos.

New Goods and Specialties



Airex Pressure Gun

Puncture-Proof Chemical

AFTER tests over hundreds of thousands of miles in actual service, a new puncture-proof chemical discovery recently was introduced by the General Tire & Rubber Co., Akron, O. Known as Airex and developed by a German, Hans Wagner, it is being marketed through the Dutch Airex Corp. of America, Ltd., Akron. Demonstrations reveal that Airex makes tires run cooler and that it reduces to a minimum the natural seepage of air through rubber, thus preventing injury to the tire through under-inflation.

Airex is applied to inner tubes through the valve stems by a special Airex pressure gun, operated by attachment to an air tank with pressure of between 100 and 150 pounds. It is not necessary to remove the tires to apply the chemical, and there is nothing to add or mix to it. Rotation of the wheel on the road spreads a protective coating of Airex inside the tube, which coating remains in place regardless of the length of time the tire stands. It is claimed that Airex never clogs the air valve. Punctures close up immediately and permanently in Airex-treated tubes, tests have shown. Tires punctured with sixty nail and spike holes have made test runs of seven months' duration without losing a pound of air pressure, it is further said.

Tire Chains

MOTORISTS who use steel tire chains and are dissatisfied with their short life, noise, and bumpy riding will welcome chains that eliminate these objectionable features.

The Woodworth steel studded rubber tire chains promise the firm grip of steel with the long wear and quietness of rubber. They are made of good-quality tire fabric and rubber. Fasteners at both ends of the side chains give unlimited adjustment without cutting off the side chains. The side chain on the outside of the tire has a snap connection midway between the ends which makes possible putting on the chain without jacking up or rolling the wheel.

A new emergency chain also is available, especially adapted for modern cars and designed to fit all types of spoke wheels. This steel studded rubber device has a waterproof web strap that pulls around a round pin in the buckle which cannot cut or wear it. The strap, moreover, is rubber covered to prevent chafing the paint of the wheel.

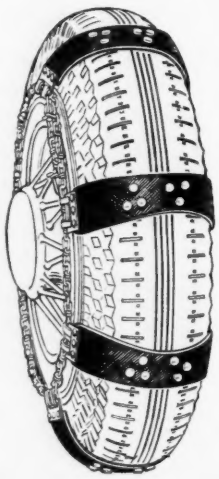
A lightweight steel studded rubber emergency chain is made similar to the above, but of lighter weight material and with only two studs in each chain and without the rubber protective covering on the strap. Woodworth Specialties Co.

Oil-Resisting Air Hose

A NEW air hose, designed especially to overcome the deteriorating effects of hot oil from air compressors, is announced by The Republic Rubber Co. The tube is made from a compound similar to that used in oil conducting hose and can actually be saturated with oil for long periods of time without affecting its serviceability. Besides the hose has great resistance to heat, high pressures, abrasion, the cutting effect of sharp rock, and exposure to sun and weather. It is recommended for mines, quarries, rock industries, road work, contracting, and general industrial use where service is exceptionally severe on the hose.

Great strength has been obtained, without impairing flexibility, by constructing the plies from a specially twisted cord thoroughly impregnated with a new tenacious rubber compound. This also increases the bursting and working pressures and results in greater resistance to shock and abuse.

All construction details of the new hose have been so balanced and engineered as to result in strength without excess bulk or useless weight. Hose costs can be considerably reduced because of longer life and fewer replacements.



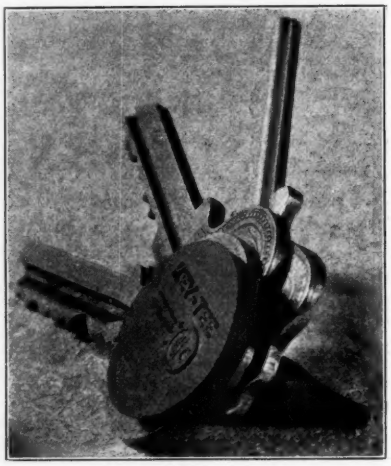
Steel Studded Rubber Tire Chain

Silent Key Holder

A CLEVER little invention to hold several keys silently and securely in pocket or purse is the Kee-Tee patented by Jay J. Sindler. It is of molded rubber fashioned like a golf tee, said to be non-tearable.

Kee-Tee is quite simple to use. You pull the point through the hole in the key. When you release the pull, the post tends to resume its original size and so squeezes against the hole and holds the key tight. This device will hold six or seven keys; only be sure to place a tight fitting key on the outside.

New Oil-Resisting Pneumatic Hose



Patented Kee-Tee

Editor's Book Table

BOOK REVIEWS

"Bankruptcy in United States History." Charles Warren. Harvard University Press, Cambridge, Mass. 1935. Cloth, 195 pages, 5½ by 8 inches. Indexed. Price $2.

This study traces the development of bankruptcy legislation in the United States since the beginning of the National Government. Three distinct periods of development are pointed out, and their story told by liberal quotations from the views expressed by those who took active part in Congressional debates on the subject. The periods referred to are: (1) The Period of the Creditor, 1789-1827; (2) The Period of the Debtor, 1827-1861; (3) The Period of National Interest, 1861-1935. The book contains much of interest.

"Index to A.S.T.M. Standards and Tentative Standards, January 1, 1936." American Society for Testing Materials, 260 S. Broad St., Philadelphia, Pa. The index is of service in ascertaining whether the Society has issued any standard specifications or test methods covering particular engineering materials or subjects and also in finding conveniently any of the standards in the publications where they appear. The latest edition gives information on all of the 794 A.S.T.M. standards and tentative standards as of January 1, 1936. All items are listed in the index under appropriate key-words according to the particular subjects they cover. As a convenience, a list is given of the specifications and tests in numeric sequence of their serial designations. Copies of this publication are furnished without charge on written request.

"Glossary of Rubber Products Exported and Instructions to Exporters, 1936. Foreign and Domestic Bulletin Service Special Circular No. 3600." Compiled and issued by Leather & Rubber Division, E. G. Holt, assistant chief. Issued free of charge. Department of Commerce, Bureau of Foreign and Domestic Commerce, N. H. Engle, acting director, Washington, D. C.

This circular contains a statement of the Schedule B class numbers under which United States exports of rubber products will be reported during 1936, together with a description of the chief items reported under each class, the classes being arranged in numerical order. This is followed by an alphabetical cross-index of commodities for the convenience of exporters.

Exporters are urged to place this circular in the hands of appropriate officials and clerks for their use and guidance in making out declarations of all export shipments.

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Self-Vulcanizing Cements. B. Fabritzief, G. Buiko, and E. Pachomova, *India Rubber J.*, Oct. 31, 1935, pp. 9-16.

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Rubber, Bitumens, and Road Surfaces. H. Barron, *India Rubber J.*, Oct. 31, 1935, pp. 23-31.

Possible Developments in the Rubber Industry. A. Calver, *India Rubber J.*, Oct. 31, 1935, pp. 32-35.

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Some Properties of Activated Carbon, E. R. Sutcliffe, *India Rubber J.*, Oct. 31, 1935, pp. 37-38.

Some Aspects of Propaganda in the Rubber Industry. J. Fairbairn. Issued by The Rubber Growers' Association (Inc.), 19 Fenchurch St., London, E.C.3, England. 7 pages.

Effect of Oxygen Absorbers in Rubber. A. A. Somerville, *Ind. Eng. Chem.*, Jan., 1936, pp. 11-18.

Fireproofing of Rubber. T. R. Dawson, *India Rubber J.*, Nov. 9, 1935, pp. 525, 533.

Reenforcement and Stearic Acid. H. Barron, *India Rubber J.*, Dec. 7, 1935, pp. 638-40.

Heat Capacity, Entropy, and Free Energy of Rubber Hydrocarbon. N. Bekkedahl and H. Matheson, Research Paper RP844, *J. of Research*, Vol. 15, Nov., 1935.

Advanced Uses of Rubber in Paints. R. L. Fine, *Am. Paint J.*, 19, 47, 44-50 (1935).

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Application of Rubber to Rayon Yarns and Fabrics. H. Roche, *Silk J.*, 10, 119, 14 (1934).

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Examination of Dispersing and Stabilizing Agents for Latex Compounds and the Behavior of Latex Compounds on Storing. O. Bachle, *Kautschuk*, Dec., 1935, pp. 219-24.

Fracture of Hydraulic Cylinders of Vulcanizing Presses. M. S. Maslenikoff, *Kautschuk*, Dec., 1935, pp. 228-31.

Experiences with Chlorinated Rubber Paints. G. Schultze, *Kautschuk*, Dec., 1935, pp. 231-32.

Homogeneous Vulcanization. H. Leduc, *Rev. gén. caoutchouc*, Nov., 1935, pp. 3-7.

Research Program for Improving Lamp Blacks for Rubber. M. Cuvex, *Rev. gén. caoutchouc*, Nov., 1935, pages 8-10.

NEW PUBLICATIONS

"El-Sixty Laboratory Tests." The Rubber Service Laboratories Co., Akron, O. This twenty-two-page mimeographed bulletin records laboratory tests on the newest accelerator, El-Sixty, showing its properties and value with various compounding materials with respect to speed of curing and improvement of physical properties in many types of rubber stocks, also its value used in combination with other accelerators.

"Commodity Exchange, Inc., Third Annual Report, November 30, 1935." Commodity Exchange, Inc., 81 Broad St., New York, N. Y. This report comprises that of the retiring president, Jerome Lewine, and those of the finance committee and treasurer, also the balance sheet of the Exchange as of November 30, 1935.

"Industrial Property Protection in Canada." Division of Commercial Laws, Bureau of Foreign and Domestic Commerce, Washington, D. C. This sixty-five page bulletin contains a concise, though complete summary of the laws of Canada relating to trade marks, patents, designs, unfair competition, indications of origin (nationality of goods), combines in restraint of trade, and cooperation in industry. References are made to pertinent provisions in the excise act, precious metals marking act, income tax law, and the criminal code. Bound in bristol, copies may be purchased for 10¢ from the New York District Office of the Bureau, 734 Customhouse, or from the Division of Commercial Laws at Washington.

"Foreign Commerce and Navigation of the United States for the Calendar Year 1934." Vol. II. United States Department of Commerce, Bureau of Foreign & Domestic Commerce, U. S. Government Printing Office, Washington, D. C., 1935. Cloth, 516 pages, 9 by 11½ inches. Indexed. This annual statistical record presents an analytical summary of the foreign commerce of the United States in the form of tables covering kinds, quantities, and values of exports and imports; general imports; foreign merchandise in transit or transshipped; tonnage tables and tables of weight. Rubber imports, exports, and imports entered for consumption are given for the calendar year 1934.

The Vanderbilt News. R. T. Vanderbilt Co., 230 Park Ave., New York, N. Y. The sixth year of publication begins with the January-February number. Its leading article is a practical treatise on Thermax, covering its form, physical and compounding properties, and uses. Profuse data and graphs confirm its advantages in low and high volume loadings; its use with various types of accelerators. Several commercial compounds containing Thermax are given.

"Du Pont Rubber Chemicals Price Schedule Effective January 1, 1936." E. I. du Pont de Nemours & Co., Inc., Rubber Chemicals Division, Wilmington, Del. Price lists cover antioxidants, accelerators, accelerator retarders and activators, latex chemicals, and rubber colors.

"Carbon Black and Calendering." General Atlas Carbon Co., 60 Wall St., New York, N. Y. This four-page folder has historical reference to Edwin M. Chaffee, inventor of the first rubber calender.

"Witcombings." Wishnick-Tumpeer, Inc., 295 Madison Ave., New York, N. Y. The "Good Cheer" issue of this house organ for December-January contains brief articles and notes of general interest.

"Cotton Production and Distribution, Season of 1934-35." Bulletin 172. United States Department of Commerce, Bureau of the Census. U. S. Government Printing Office, Washington, D. C. Paper, 54 pages. Price 15¢.

"List of Inspected Gas, Oil, and Miscellaneous Appliances—December, 1935." Underwriters Laboratories, 207 E. Ohio St., Chicago, Ill. This list, revised semi-annually, is a reference source for safety appliances for handling gas, oils, and other hazardous materials.

"Tireside Chats. No. 4." The Fisk Tire Co., Inc., Chicopee Falls, Mass. This booklet contains a series of practical suggestions indicating to the tire dealer how he can cooperate to make the roads safer and at the same time add to the legitimate profits of his business.

"Nineteenth Annual Report of the National Industrial Conference Board." National Industrial Conference Board, Inc., 247 Park Ave., New York, N. Y. The report is divided into the following sections: 1. Nature, Purposes, and Principles; 2. Organization, Structure, and Support; 3. Activities, Services, and Publications; 4. Personnel Associated with the Board; 5. Associates of the Board (company, organizations, and individual); 6. Treasurer's Report.

GENERAL

(*Continued from page* 66)

Germany

622,337. **Tire Tread.** W. Heidik, Berlin.

623,097. **Anti-skid Device.** H. Hurlimann, Wil, St. Gallen, Switzerland. Represented by A. Demeter, Berlin.

623,385. **Velvety Rubber Sheet.** B. F. Goodrich Co., New York, N. Y., U. S. A. Represented by G. Bertram and K. Lengner, both of Berlin.

624,117. **Syringe.** V. Belmonte, Venice, Italy. Represented by J. Koch, Berlin.

TRADE MARKS

United States

329,176. **Firestone.** Wringer rolls. Firestone Tire & Rubber Co., Akron, O.

329,207. **Super-Dense.** Wires and cables. General Cable Corp., New York, N. Y.

329,253. **Baltex.** Golf balls and covers therefor. Worthington Ball Co., Elyria, O.

329,260. **Top-Notch.** Golf balls. Great Western Athletic Goods Co., Chicago, Ill.

329,261. **Shor-Acre.** Golf balls. Great Western Athletic Goods Co., Chicago, Ill.

329,262. **Hitermor.** Golf balls. Great Western Athletic Goods Co., Chicago, Ill.

329,263. **C-Er-Go.** Golf balls. Great Western Athletic Goods Co., Chicago, Ill.

329,283. **Plus.** Golf balls. India Rubber, Gutta Percha & Telegraph Works Co., Ltd., London, England.

329,312. **Azo ZZZ-11.** Zinc oxide. American Zinc Sales Co., St. Louis, Mo.

329,337. **Casehardened.** Golf balls. L. A. Young Co., Detroit, Mich.

329,350. **Corsair.** Tires. A. H. Branham, receiver of Murray Rubber Co., both of Trenton, N. J.

329,381. **Tub-Joy.** Bath sponges. B. L. Woods, Chicago, Ill.

329,391. **Maconite.** Electric cables and insulation therefor. Macintosh Cable Co., Ltd., Derby, England.

329,413. Representation of a winged foot between the words: **"Good Year."** Mats. Goodyear Tire & Rubber Co., Akron, O.

329,440. **Metric.** Ebonite clarinets and oboes, etc. Ludwig Music House, Inc., St. Louis, Mo.

329,448. **Gardette.** Sanitary belts. Belreid Corp., New York, N. Y.

329,470. **Ariel.** Inner tubes and tube repair kits. Fisk Rubber Corp., Chicopee Falls, Mass.

329,488. Representation of the globe. Tires and tubes. Atlas Supply Co., Newark, N. J.

329,528. **David Copperfield.** Erasers, etc. David Kahn, Inc., No. Bergen, N. J.

329,529. **Treasure.** Erasers, etc. David Kahn, Inc., No. Bergen, N. J.

329,530. **Treasure Chest.** Erasers, etc. David Kahn, Inc., No. Bergen, N. J.

329,577. Circle containing representation of a lion. Windshield wipers, splash guards, etc. Max Zaiger, doing business as Lion Products Co., Lynn, Mass.

329,592. Representation of erupting volcano, and the words: **"Chamberlain Vacuum Dough. The Hotter It Is the Deeper It Goes."** Tube repair kits. L. R. Chamberlain, doing business as Chamberlain Sales Co., San Antonio, Tex.

329,616. **Syntrex.** Dental supplies. E. De Trey, Zurich, Switzerland.

329,694. **Reogen.** Chemical composition used in compounding rubber. Robert J. King Co., Inc., So. Norwalk, Conn.

329,725. **Brentwood.** Tires. Pharis Tire & Rubber Co., Newark, O.

(*Concluded on page* 82)

CLASSIFIED ADVERTISEMENTS

ALL CLASSIFIED ADVERTISING MUST BE PAID IN ADVANCE

GENERAL RATES	SITUATIONS WANTED RATES	SITUATIONS OPEN RATES
Light face type $1.00 per line (ten words)	Light face type 40c per line (ten words)	Light face type 75c per line (ten words)
Bold face type $1.25 per line (eight words)	Bold face type 55c per line (eight words)	Bold face type $1.00 per line (eight words)

Allow nine words for keyed address. *Replies forwarded without charge.*

SITUATIONS WANTED

RUBBER ENGINEER, WITH OUTSTANDING ESTABLISHED developments, would like to make connection with progressive organization. Address Box No. 607, care of INDIA RUBBER WORLD.

EXECUTIVE, NOW EMPLOYED, DESIRES POSITION OF RESponsibility in large or small rubber plant. Graduate engineer, thorough knowledge of plant and property accounting, appraisals, manufacturing costs, production control, mechanical development, plant maintenance, etc. Location, anywhere in east including Canada. Address Box No. 609, care of INDIA RUBBER WORLD.

RUBBER COMPOUNDER, DEVELOPMENT, CONTROL AND testing. Eighteen years' development and factory experience. Compound all types of rubber goods. Will consider production work or sale of raw materials. Address Box No. 610, care of INDIA RUBBER WORLD.

CHIEF CHEMIST COMPOUNDER: 16 YEARS' EXPERIENCE IN up-to-date compounding and manufacturing of druggists' sundries, miscellaneous molding, hand-made articles, acid cured articles, hollow balls, hard rubber, dipped goods, adhesive and medicated plasters, diplomatic, energetic, capable, best reference. Address Box No. 611, care of INDIA RUBBER WORLD.

FOREMAN OF MIXING, MILL, AND CALENDER DEPARTMENTS desires to make a change. Twelve years' practical experience in rubber footwear and tire production. At present employed. Address Box No. 612, care of INDIA RUBBER WORLD.

GRADUATE CHEMIST WANTS POSITION AS SUPERINTENDent or development engineer. Ten years' experience in mechanical goods, thorough knowledge of compounding, factory development, and production. Energetic, diplomatic, resourceful, with initiative, and a good organizer. Address Box No. 613, care of INDIA RUBBER WORLD.

SITUATIONS WANTED—Continued

FACTORY MANAGER, WITH TWENTY-FIVE YEARS' EXPERIence in rubber industry, can guarantee satisfaction with active concern or will build up organization with present staff, making replacements only if necessary with former assistants that have been tested. Address Box No. 614, care of INDIA RUBBER WORLD.

SITUATIONS OPEN

CHEMIST

Manufacturer of adhesives and sealing cements has opening for a chemist with a knowledge of the adhesive field. Real opportunity for qualified man. Must have had road and customer experience. State age, married or single, present salary, educational background, and history of duties performed with last three companies. Salary and bonus arrangement. All our chemists know of this advertisement. Address Box No. 615, care of INDIA RUBBER WORLD.

FOREMAN ON ALL KINDS OF RUBBERIZED FABRICS: ONE capable to take charge of plant. Very good opportunity for the right party. State qualifications, salary, experience, and references. Address Box No. 616, care of INDIA RUBBER WORLD.

WANTED: TECHNICALLY TRAINED MAN WITH COMPOUNDing experience to travel in Ohio and adjacent states. Address Box No. 617, care of INDIA RUBBER WORLD.

(Advertisements continued on page 83)

Trade Marks

(*Concluded from page 80*)

329,740. **Red Edge.** Printer's blankets. Behr-Manning Corp., Troy, N. Y.

329,741. **Green Edge.** Printer's blankets. Behr-Manning Corp., Troy, N. Y.

329,805. **All-Weather.** Mats. Goodyear Tire & Rubber Co., Akron, O.

329,824. **Lavlex.** Rubber wash cloths. L. C. Lordly, doing business as Paintex Co., Wallington, N. J.

329,827. Representation of a star containing the words: **"5 point,"** and above the representation the word: **"Supreme."** Camelback rubber stock for tire repairing. Fisk Rubber Corp., Chicopee Falls, Mass.

329,858. Fanciful label containing the word: **"Stix."** Patching and repair kits. Buckeye Reliner Producing Co., Lima, O.

329,873. **Tagball.** Footballs. Draper-Maynard Co., Plymouth, N. H.

329,903. Hexagon containing representation of a pair of barefoot soles with a diagonal line across them, and around the hexagon the words: **"National Foot Health—1914—Cambridge Rubber Company, 1935-6."** Footwear. Cambridge Rubber Co., Cambridge, Mass.

329,931. **Rex-Hide.** Windshield wiper blades. Rex-Hide, Inc., E. Brady, Pa.

330,009. **Tip Top Tube.** Rubber tubing for merchandise containers. Midland Products, Inc., St. Louis, Mo.

330,144. **Gibraltar.** Footwear. Sears, Roebuck & Co., Chicago, Ill.

330,201. **Silverpac.** Prophylactic rubber articles. Goodwear Rubber Co., Inc., New York, N. Y.

330,284. **Continental.** Druggists' sundries and hospital supplies. Continental Gummi-Werke A. G., Hanover, Germany.

330,308. Representation of an eagle atop a black ball, and across the ball the words: **"G-Men."** Stationers' supplies. Spatz Bros., New York, N. Y.

330,322. Diamond containing the word: **"Jenkins,"** and below the diamond the words: **"Jenkins Bros."** Friction and insulating tape and splicing compound. Jenkins Bros., New York, N. Y.

330,347. **Sprco.** Chemical boiler and heater cleaning compound. San Pedro Rubber & Supply Co., Wilmington, Calif.

Tire Production Statistics

	Pneumatic Casings—All Types			Solid and Cushion Tires		
	Inventory	Production	Total Shipments			
1933	**7,110,456**	**36,243,384**	**35,274,970**	**1933**	**26,271**	**130,987**	**126,990**
1934	**9,171,335**	**45,815,763**	**45,285,955**	**1934**	**34,710**	**197,497**	**187,152**
1935				**1935**			
Jan.	**10,085,737**	**4,487,679**	**3,552,737**	**Jan.**	**31,581**	**21,510**	**20,300**
Feb.	**11,183,674**	**4,251,183**	**3,188,772**	**Feb.**	.....	**17,657**	**16,183**
Mar.	**11,325,010**	**4,215,214**	**4,078,007**	**Mar.**	.....	**17,603**	**20,224**
Apr.	10,673,140	4,376,383	4,989,291	Apr.	.....	20,002	21,783
May	**10,796,842**	**4,049,915**	**3,945,364**	May	.....	22,533	21,150
June	**10,432,738**	**3,792,537**	**4,134,489**	June	.....	**16,067**	**20,053**
July	**8,584,018**	**3,425,879**	**5,283,696**	July	.....	21,904	20,287
Aug.	**7,570,902**	**3,873,016**	**4,597,081**	Aug.	.....	31,970	30,127
Sept.	8,039,190	3,673,267	3,204,233	Sept.	.....	28,468	23,796
Oct	8,041,876	3,928,994	3,972,623	Oct.	.....	32,204	30,483
Nov.	8,001,743	3,877,114	3,870,181	Nov.	.....	27,158	23,259

	Inner Tubes—All Types		
1933	**6,251,941**	**34,044,689**	**33,112,472**
1934	**8,904,496**	**44,840,971**	**43,694,130**
1935			
Jan.	**9,332,489**	**4,131,004**	**3,610,371**
Feb.	**10,151,721**	**4,046,062**	**3,261,488**
Mar.	**10,094,170**	**3,999,030**	**4,043,350**
Apr.	9,864,446	4,131,658	4,319,648
May	**10,296,437**	**3,775,145**	**3,347,258**
June	**9,748,054**	**3,376,082**	**3,903,645**
July	**7,765,239**	**3,153,068**	**5,111,012**
Aug.	**6,730,932**	**3,776,743**	**4,419,013**
Sept.	7,337,698	4,001,165	3,322,750
Oct.	7,811,072	4,301,640	3,906,562
Nov.	7,916,510	3,824,124	3,634,370

	Cotton and Rubber Consumption Casings, Tubes, Solid and Cushion Tires		Consumption of Motor Gasoline (100%)
	Cotton Fabric Pounds	Crude Rubber Pounds	Gallons
1933	**148,989,293**	**512,489,423**	**15,880,746,000**
1934	**196,069,495**	**697,558,218**	**17,063,298,000**
1935			
Jan.	**19,607,932**	**72,968,356**	**1,178,604,000**
Feb.	**18,058,726**	**66,463,131**	**1,133,378,000**
Mar.	**17,581,651**	**64,583,859**	**1,343,874,000**
Apr.	17,944,131	71,286,972	1,515,129,000
May	**17,328,212**	**67,822,472**	**1,641,738,000**
June	**15,802,601**	**58,152,530**	**1,591,128,000**
July	**14,867,923**	**56,042,744**	**1,730,526,000**
Aug.	**16,568,852**	**58,726,516**	**1,801,842,000**
Sept.	15,096,484	57,002,155	1,590,204,000
Oct.	16,942,205	63,378,556	1,738,842,000
Nov.	16,194,360	61,208,599	1,510,152,000

Rubber Manufacturers Association, Inc., figures representing approximately 97% of the industry for 1934 and 1935 and 80% for previous years, with the exception of gasoline consumption.

New York Outside Market

(*Continued from page 67*)

smoked sheet at levels above 13¢. Factory demand during January was particularly brisk in the face of continuously increasing prices to the highest figures since October, 1934. The weekend closing prices for the past two months follow: December 7, 13⅛¢; December 14, 13⅛¢; December 21, 13¼¢; December 28, 13⅜¢; January 4, 13⅝¢; January 11, 14⅛¢; January 18, 14¼¢; and January 25, 15¢.

Rubber consumption in the United States during 1935, according to R.M.A. reports, reached the all-time peak of 497,150 long tons, approximately 3,000 tons in excess of that of the previous banner year 1929. December consumption was 42,942 long tons, compared with 42,778 for November and 36,569 for December, 1934.

Rubber Trade Inquiries

The inquiries that follow have already been answered; nevertheless they are of interest not only in showing the needs of the trade, but because of the possibility that additional information may be furnished by those who read them. The Editor is therefore glad to have those interested communicate with him.

No.	Inquiry
2010	Manufacturer of white rubber substitutes.
2011	Manufacturer of porcelain dipping forms.
2012	Manufacturer of thin rubber dress shields.
2013	Manufacturer of carbon black.
2014	Manufacturer of rubber bands.
2015	Manufacturer of rubber hose.
2016	Location of factory building auto tires by hand.
2017	Supplier of holland cloth.
2018	Manufacturer of strong red dyes suitable for hard rubbers.
2019	Manufacturer of vulcanizers for rubber balls.
2020	Manufacturer of sponge rubber.
2021	Manufacturer of doubled fabrics.
2022	Manufacturer of Brighton Mills crimp tester.
2023	Manufacturer of Accelerator 552.
2024	Manufacturer of gear shift balls.
2025	Manufacturer of automobile corner hood protectors.
2026	Manufacturer of rubber matting from old tires.
2027	Manufacturer of heavy rubber aprons for industrial use.
2028	Manufacturer of linen fire hose.
2029	Manufacturer of gutta-percha backed velvet or satin.
2030	Manufacturer of cotton flock.
2031	Manufacturer of rubber tubing.
2032	Supplier of sponge rubber in rolls 36 and 48 inches wide in different thicknesses.
2033	Manufacturer of Durometer tester.
2034	Manufacturer of window display figures of latex or rubber.
2035	Manufacturer of tubes for straining reclaimed rubber.

World Net Imports of Crude Rubber

Year	U.S.A.	U.K.	Australia	Belgium	Canada	Central Europe	France	Germany	Italy	Japan	Russia	Rest of the World	Total
1933	**398,400**	**73,300**	**13,500**	**11,200**	**19,300**	**18,900**	**63,100**	**54,100**	**19,300**	**66,900**	**30,800**	30,100	798,900
1934	**438,941**	**158,481**	**9,642**	**9,116**	**28,439**	**23,427**	**50,405**	**59,330**	**21,403**	**69,934**	**47,272**	43,166	959,556
1935													
Jan.	39,546	20,383	1,099	419	2,670	1,966	5,678	4,286	1,648	4,402	3,446	3,673	89,216
Feb.	45,999	15,609	848	399	1,558	2,547	4,670	3,513	4,357	5,585	1,810	3,599	90,494
Mar.	44,772	12,810	1,458	240	2,710	1,463	4,085	6,353	1,582	4,423	4,624	3,592	88,112
Apr.	40,061	11,574	1,150	520	1,063	1,491	3,368	5,820	1,653	6,635	3,387	3,539	80,261
May	29,962	12,498	671	982	3,929	1,565	3,900	6,050	935	5,432	1,937	3,682	71,543
June	31,410	10,253	496	1,065	1,435	1,576	3,270	4,551	1,831	3,375	3,088	3,693	66,043
July	47,694	9,454	520	572	1,319	1,079	3,308	4,929	1,298	4,486	1,823	3,237	79,719
Aug.	41,057	14,120	655	527	2,814	1,738	4,593	4,790	916	4,454	1,227	3,729	80,620
Sept.	35,256	11,223	449	867	1,604	1,953	3,810	5,453	1,696	3,591	1,593	3,855	71,290
Oct.	35,770	3,184	829	539	812	2,159	5,272	6,074	2,500*	4,729	4,876	4,100*	70,844

* Estimate. Source: *Statistical Bulletin of the International Rubber Regulation Committee.*

Classified Advertisements

Continued

BUSINESS OPPORTUNITIES

WILL PURCHASE SURPLUS LOTS OF EXTRACTED RESINS from rubber and balata. Address Box No. 618, care of INDIA RUBBER WORLD.

MACHINERY AND SUPPLIES FOR SALE

FOR SALE: ONE NO. 4 ROYLE TUBER, DIRECT MOTOR DRIVE; one Farrel Experimental Rubber Mill, 8 by 13" Motor Drive; one 16 by 36" Farrel Mill with 40 H.P. A.C. Motor and Thropp Reduction Gear Drive; Presses all sizes up to 60 by 60"; several Mills and Calenders up to 66"; Vacuum Shelf Driers, Werner and Pfleiderer Mixers; Banbury Mixers, Churns, etc. Send us your inquiries. What have you for sale? CONSOLIDATED PRODUCTS COMPANY, INC., 13-16 Park Row, New York, N. Y.

(*Advertisements continued on page* 85)

U. S. Crude and Waste Rubber Imports for 1935

	Plantations	Latex	Paras	Africans	Centrals	Guayule	Manicoba and Matto Grosso	Totals 1935	Totals 1934	Balata	Miscellaneous	Waste
Jan. .....*tons*	41,188	599	201	30	41	..	..	42,059	46,204	26	553	..
Feb.	33,722	388	1,208	14	51	..	..	35,383	31,032	73	194	29
Mar.	42,373	967	513	167	21	..	..	44,041	44,605	55	659	40
Apr.	41,857	1,089	531	63	5	..	..	43,545	45,662	60	644	14
May	25,256	1,106	294	60	..	50	..	26,766	47,954	55	474	16
June	36,833	860	467	80	..	100	..	38,340	49,683	135	521	20
July	45,456	973	291	46	14	100	..	46,880	41,530	84	553	25
Aug.	37,199	1,170	166	65	5	50	..	38,655	33,248	25	484	18
Sept.	33,329	940	196	70	17	17	..	34,569	28,835	83	276	30
Oct.	32,816	1,236	143	43	75	43	..	34,356	35,298	27	555	26
Nov.	27,166	837	646	70	44	63	..	28,826	36,233	55	498	96
Dec.	33,048	988	364	51	76	69	..	34,596	29,200	47	547	150
Total 12 mos., 1935 .....*tons*	430,243	11,153	5,020	759	349	492	..	448,016	.....	725	5,958	464
Total 12 mos., 1934 .....*tons*	454,442	10,726	3,661	166	89	400	..	.....	469,484	1,153	6,443	668

Compiled from The Rubber Manufacturers Association, Inc., statistics.

United States Latex Imports

Year	Pounds	Value
1931	10,414,712	$884,355
1932	11,388,156	601,999
1933	24,829,861	1,833,671
1934	29,276,134	3,633,253
1935		
Jan.	1,898,962	287,583
Feb.	1,282,941	179,583
Mar.	2,889,525	354,654
Apr.	3,854,892	415,108
May	3,197,450	380,844
June	1,324,776	152,665
July	2,563,366	303,518
Aug.	2,764,572	370,431
Sept.	2,347,111	291,652
Oct.	2,881,960	342,101
Nov.	2,292,102	261,668

Data from Leather and Rubber Division, United States Department of Commerce, Washington, D. C.

Shipments of Crude Rubber from Producing Countries

Year	Malaya including Brunei and Labuan	N.E.I.	Ceylon	India	Burma	North Borneo	Sarawak	Siam	French Indo-China	Philippines and Oceania Total	Oceania	Africa	South America	Mexican Guayule	Grand Total
1933	445,800	282,300	63,800	1,400	3,400	7,800	11,100	7,000	17,300	839,900	1,100*	2,000	10,100	0	853,100
1934	467,030	379,401	79,068	5,735	5,719	11,086	17,708	17,714	19,559	1,003,020	1,233*	2,921	9,143	398	1,016,715
1935															
Jan.	41,665	18,726	6,294	1,552	945	1,238	1,536	2,614	2,575	77,145	105	467	1,785	0	79,502
Feb.	32,824	27,835	5,551	344	489	760	1,880	2,288	2,018	73,989	156	254	926	0	75,325
Mar.	34,047	22,402	1,720	269	471	773	1,874	2,076	1,440	65,072	82	525	992	0	66,671
Apr.	37,442	26,156	3,749	250	263	846	1,875	1,661	2,827	75,069	134	185	1,146	0	76,534
May	27,740	36,289	4,473	322	484	848	1,977	2,752	1,800	76,685	134	315	756	50	77,940
June	31,198	29,337	3,525	797	383	603	1,983	2,869	2,516	73,211	142	393	895	103	74,744
July	37,826	20,990	4,106	556	229	1,164	1,752	1,939	1,957	70,519	125	407	407	52	71,510
Aug.	40,990	21,154	5,683	732	102	566	772	2,062	3,662	75,723	143	442	1,207	50	77,565
Sept.	40,984	20,447	4,053	561	120	421	1,758	2,278	2,248	72,870	94	441	1,249	17	74,671
Oct.	29,007	28,162	5,932	939	259	1,040	1,722	2,622	2,750	72,433	180	300*	1,493	43	74,449
Nov.	32,738	17,367	4,288	1,284	563	455	1,163	2,155	2,405	62,418	150*	400*	1,316	50*	64,334

*Estimate. Source: *Statistical Bulletin of the International Rubber Regulation Committee.*

Rims Approved by The Tire & Rim Association, Inc.

Rim Size	12 Mos., 1935 No.	%	12 Mos., 1934 No.	%
Drop Center Rims, 16" Dia. and Under				
15x5.50E	10	0.0	6,603	0.1
15x6.00E	.....	...	208	0.0
16x3.50D	.....	...	25	0.0
16x4.00D	1,508,857	8.1	1,736,761	14.1
16x4.25D	1,093,000	5.9	698,816	5.7
16x4.50D	276,552	1.5	644,550	5.2
16x5.00E	13,739	0.1	59,614	0.5
16x5.50E	9,063	0.0	14,201	0.1
16x6.00E	.....	...	49	0.0
15x3.00D	8,177	0.0	1,185	0.0
15x5.00F	33,036	0.2	.....	...
15x5.50F	100,118	0.5	756	0.0
16x3.25D	.....	...	44	0.0
16x4.00E	4,158,595	22.3	240,910	1.9
16x4.25E	164,588	0.9	.....	...
16x4.50E	2,892,393	15.5	749,015	6.1
16x5.00F	242,519	1.3	116,739	0.9
16x5.50F	7,080	0.0	8,939	0.1
16x6.00F	4,926	0.0	.....	...
Drop Center Rims, 17" Dia. and Over				
17x3.00D	1,146,594	6.1	985,876	8.0
17x3.25E	687,829	3.7	1,097,064	8.9
17x3.62F	2,216,842	11.9	2,153,484	17.5
17x4.00F	49,005	0.3	47,137	0.4
17x4.19F	21,438	0.1	11,471	0.1
17x5.00F	6,842	0.0	.....	...
18x2.15B	15,854	0.1	27,300	0.2
18x3.00D	19,287	0.1	23,662	0.2
18x3.25E	14,380	0.1	102,663	0.8
18x3.62F	.....	...	338	0.0
18x4.00F	21	0.0	4,808	0.0
18x4.19F	14,976	0.1	13,005	0.1
19x2.15B	11,631	0.1	12,870	0.1
19x3.00D	20,443	0.1	42,516	0.3
19x3.25E	19,112	0.1	2,418	0.0
20x3.25E	10,002	0.1	1,191	0.0
21x3.25E	4,310	0.0	7,372	0.1
Flat Base Passenger Rims				
17x4	1,276	0.0	1,640	0.0
17x4½	422	0.0	283	0.0
17x5	5,251	0.0	10,468	0.1
17x6	7,010	0.0	2,032	0.0
18x3.00D	.....	...	1,451	0.0
18x3.25E	1,199	0.0	1,459	0.0
18x4	1,626	0.0	5,220	0.0
18x4½	386	0.0	454	0.0
18x5	2,382	0.0	1,475	0.0
19x2.75D	7,473	0.0	7,931	0.1
19x3.00D	2,798	0.0	4,480	0.0
19x3.25E	279	0.0	39	0.0
19x3½	.....	...	519	0.0
19x4	6,474	0.0	15,178	0.1
19x4½	1,227	0.0	5,573	0.0
19x5	775	0.0	3,510	0.0
19x6	27	0.0	176	0.0
20x2.75D	3,726	0.0	9,654	0.1
20x3.00D	283	0.0	.....	...
20x3½	2,996	0.0	5,609	0.0
20x4	634	0.0	2,638	0.0
20x4½	3,552	0.0	7,256	0.1
20x5	12,893	0.1	27,664	0.2
20x6	157	0.0	4,043	0.0
21x2.75D	968	0.0	345	0.0
21x3½	11,868	0.1	22,635	0.2
21x4	1,221	0.0	2,756	0.0
21x4½	3,889	0.0	7,974	0.1
21x5	.....	...	361	0.0
21x6	.....	...	521	0.0
Rims for High Pressure Tires (Pass.)				
30x3½	1,379	0.0	3,996	0.0
31x4	94	0.0	.....	...
32x4	304	0.0	639	0.0
32x4½	973	0.0	619	0.0
34x4½	.....	...	208	0.0
18" Truck Rims				
18x5	190	0.0	1,251	0.0
18x6	1,279	0.0	141	0.0
18x7	31,535	0.2	30,029	0.2
18x8	1,564	0.0	2,388	0.0
18x9/10	10	0.0	.....	...
20" Truck Rims				
20x5	1,717,447	9.2	1,958,670	15.9
20x6	1,496,181	8.0	947,465	7.7
20x7	262,946	1.4	207,780	1.7
20x8	105,096	0.6	84,780	0.7
20x9/10	11,764	0.1	11,989	0.1
20x10.50	108	0.0	1,140	0.0
20x11	932	0.0	531	0.0
22" Truck Rims				
22x7	1,090	0.0	3,655	0.0
22x8	15,983	0.1	14,348	0.1
22x9/10	6,552	0.0	6,502	0.1
24" Truck Rims				
24x5	.....	...	257	0.0
24x6	2,797	0.0	4,236	0.0
24x7	11,737	0.1	14,312	0.1
24x8	20,355	0.1	20,378	0.2
24x9/10	8,505	0.0	10,611	0.1
24x11	1,965	0.0	814	0.0
Drop Center Tractor Rims				
24x6.00S	3,697	0.0	3,810	0.0
24x8.00T	36,753	0.2	16,373	0.1
28x6.00S	601	0.0	.....	...
28x8.00T	13,569	0.1	4,496	0.0
32x8.00T	839	0.0	.....	...
36x6.00S	35,996	0.2	11,787	0.1
36x8.00T	5,537	0.0	643	0.0
40x6.00S	950	0.0	.....	...
40x8.00T	190	0.0	.....	...
Cast Rims				
10x5.00F	4,140	0.0	.....	...
10x6.00F	111	0.0	.....	...
24x11.25	191	0.0	.....	...
24x13	7	0.0	.....	...
24x15	158	0.0	.....	...
Clincher Rims (Auto)				
30x3½	5,408	0.0	5,853	0.0
Clincher Rims (M.C.)				
24x3	249	0.0	382	0.0
D. C. Airplane Rims				
12x3	3,163	0.0	973	0.0
Totals	18,664,356	..	12,335,990	..

Classified Advertisements

Continued

MACHINERY AND SUPPLIES WANTED

WANTED: HYDRAULIC PRESSES, TWO OR MORE, STEEL plates, 2,000 lbs. water pressure, four-opening, 20" or larger rams. Address Box No. 608, care of INDIA RUBBER WORLD.

United States Statistics

Imports for Consumption of Crude and Manufactured Rubber

	October, 1935		Ten Months Ended October, 1935	
UNMANUFACTURED—*Free*	Pounds	Value	Pounds	Value
Crude rubber	78,004,726	$8,742,222	872,497,238	$99,251,752
Liquid latex	2,881,960	342,101	25,005,555	3,078,131
Jelutong or pontianak	465,098	33,261	11,114,051	940,584
Balata	61,436	7,641	1,151,696	158,409
Gutta percha	79,595	20,661	3,305,058	476,266
Guayule	96,000	8,112	705,200	59,587
Scrap and reclaimed, etc.	592,383	7,980	6,524,938	82,982
Totals	82,781,198	$9,161,978	920,303,736	$104,047,711
Chicle, crude ..... *Free*	470,566	$136,418	5,054,009	$1,143,145
MANUFACTURED—*Dutiable*				
Rubber soled footwear with fabric uppers ..... *pairs*	86,098	$18,389	752,933	$188,624
Rubber toys	93,166	11,195	1,143,712	143,560
Druggists' sundries, n. e. s.	.....	4,001	.....	74,020
Combs, hard rubber.. *number*	83,717	4,424	678,246	38,060
Golf balls ..... *number*	14,568	2,298	523,361	88,998
Tennis and other rubber balls ..... *number*	157,286	4,179	3,204,682	147,967
Tires ..... *number*	1,083	1,746	36,090	72,367
Other rubber manufactures..	.....	32,879	.....	354,845
Totals	.....	$79,111	.....	$1,108,441

Exports of Foreign Merchandise

RUBBER AND MANUFACTURES				
Crude rubber	1,458,578	$188,518	20,581,445	$2,458,541
Balata	4,731	939	160,933	40,214
Gutta percha, rubber substitutes, and scrap	.....	.....	44,503	7,879
Rubber manufactures	.....	460	.....	16,867
Totals	.....	$189,917	.....	2,523,501

Exports of Domestic Merchandise

RUBBER AND MANUFACTURES				
Reclaimed	1,296,048	$60,675	9,503,595	$462,401
Scrap	6,043,778	130,086	47,352,618	939,545
Rubberized automobile cloth, *sq. yd.*	43,395	18,609	458,597	228,687
Other rubberized piece goods and hospital sheeting..*sq. yd.*	134,888	49,382	908,410	369,004
Footwear				
Boots ..... *pairs*	8,295	18,107	69,975	150,477
Shoes ..... *pairs*	8,518	6,064	142,931	74,034
Canvas shoes with rubber soles ..... *pairs*	17,679	9,084	417,300	202,909
Soles ..... *doz. prs.*	2,961	5,356	23,807	40,371
Heels ..... *doz. prs.*	42,393	24,133	354,704	205,215
Soling and top lift sheets..	35,506	9,719	209,102	41,148
Water bottles and fountain syringes ..... *number*	30,958	9,533	195,037	66,614
Gloves ..... *doz. prs.*	9,551	12,135	53,955	107,431
Other druggists' sundries....	.....	35,588	.....	321,868
Balloons ..... *gross*	21,113	19,098	196,318	174,689
Toys and balls.....	.....	16,652	.....	69,532
Bathing caps ..... *doz.*	4,339	4,090	49,799	84,816
Bands	17,723	6,455	178,167	62,319
Erasers	36,848	19,219	303,999	167,971
Hard rubber goods				
Electrical goods	217,125	20,177	1,537,771	146,998
Other goods	.....	28,988	.....	179,674
Tires				
Truck and bus casings, *number*	13,420	282,347	148,628	2,764,100
Other automobile casings, *number*	58,793	550,922	618,316	5,474,717
Tubes, auto ..... *number*	53,006	79,452	529,266	737,950
Other casings and tubes, *number*	4,476	15,107	36,193	141,144
Solid tires for automobiles and motor trucks..*number*	433	12,432	4,425	127,598
Other solid tires.....	62,523	9,140	882,822	123,645
Tire sundries and repair materials	.....	43,579	.....	347,729
Rubber and friction tape....	49,765	18,157	475,122	131,554
Belting	350,170	145,684	2,218,492	1,078,014
Hose	314,506	114,532	3,374,998	1,027,046
Packing	158,949	57,619	1,263,077	440,795
Thread	85,266	51,179	932,258	562,685
Other rubber manufactures..	.....	134,063	.....	1,334,959
Totals	.....	$2,017,963	.....	$18,387,639

Dividends Declared

Company	Stock	Rate	Payable	Stock of Record
Anaconda Wire & Cable Co.	Com.	$0.25	Mar. 16	Feb. 14
Goodyear Rubber Co.	Pfd.	$2.50 Accum.	Feb. 1	Jan. 22
Goodyear Tire & Rubber Co. of Calif.	7% Pfd.	$0.50 Accum.	Dec. 30	Dec. 26
Mid-West Rubber Reclaiming Co.	$4 Pfd.	$1.00 Accum.	Jan. 30	Jan. 20
Narrow Fabric Co.	6½% 1st Pfd.	$1.50 s.a.	Dec. 20	Dec. 10

Rubber Goods Production Statistics

TIRES AND TUBES*		1935 Oct.	1934 Oct.
Pneumatic casings			
Production	*thousands*	3,281	3,188
Shipments, total	*thousands*	3,317	2,919
Domestic	*thousands*	3,258	2,834
Stocks, end of month	*thousands*	6,715	8,397
Solid and cushion tires			
Production	*thousands*	27	17
Shipments, total	*thousands*	25	15
Domestic	*thousands*	25	14
Stocks, end of month	*thousands*	38	35
Inner tubes			
Production	*thousands*	3,592	3,123
Shipments, total	*thousands*	3,262	2,609
Domestic	*thousands*	3,215	2,543
Stocks, end of month	*thousands*	6,523	7,907
Raw material consumed			
Fabrics	*thous. of lbs.*	14,148	13,169
MISCELLANEOUS PRODUCTS			
Rubber bands, shipments	*thous. of lbs.*	334	330
Rubber-proofed fabrics, production, total	*thous. of yds.*	5,571	5,279
Auto fabrics	*thous. of yds.*	449	804
Raincoat fabrics	*thous. of yds.*	2,866	2,813
Rubber flooring, shipments	*thous. of sq. ft.*	492	386
Rubber and canvas footwear			
Production, total	*thous. of prs.*	5,874	5,078
Tennis	*thous. of prs.*	1,297	1,201
Waterproof	*thous. of prs.*	4,577	3,877
Shipments, total	*thous. of prs.*	5,733	5,525
Tennis	*thous. of prs.*	673	790
Waterproof	*thous. of prs.*	5,059	4,735
Shipments, domestic, total	*thous. of prs.*	5,705	5,486
Tennis	*thous. of prs.*	654	758
Waterproof	*thous. of prs.*	5,051	4,727
Stocks, total, end of month	*thous. of prs.*	14,700	15,248
Tennis	*thous. of prs.*	4,761	6,085
Waterproof	*thous. of prs.*	9,939	9,163
Rubber heels			
Production	*thous. of prs.*	....	14,437
Shipments, total	*thous. of prs.*	....	16,889
Export	*thous. of prs.*	....	377
Repair trade	*thous. of prs.*	....	5,238
Shoe manufacturers	*thous. of prs.*	....	11,273
Stocks, end of month	*thous. of prs.*	....	40,016
Rubber soles			
Production	*thous. of prs.*	....	3,239
Shipments, total	*thous. of prs.*	....	3,297
Export	*thous. of prs.*	....	13
Repair trade	*thous. of prs.*	....	584
Shoe manufacturers	*thous. of prs.*	....	2,699
Stocks, end of month	*thous. of prs.*	....	4,656
Mechanical rubber goods, shipments			
Total	*thous. of dollars*	5,015	3,715
Belting	*thous. of dollars*	1,155	996
Hose	*thous. of dollars*	1,438	1,376
Other	*thous. of dollars*	2,422	1,343

*Data for 1934 and for January to July, 1935, are estimated to represent approximately 97% of the industry; for August, September, and October, 1935, the coverage is estimated to be 81%.

Source: *Survey of Current Business*, Bureau of Foreign & Domestic Commerce, Washington, D. C.

Imports by Customs Districts

	—November, 1935— *Crude Rubber Pounds	Value	—November, 1934— *Crude Rubber Pounds	Value
Massachusetts	5,413,278	$581,074	7,174,015	$958,631
New York	42,820,663	4,653,469	65,404,875	8,442,918
Philadelphia	230,273	28,194	2,765,613	365,085
Maryland	1,418,044	154,693	1,509,306	187,514
Mobile	1,284,104	136,739	.....	.....
New Orleans	1,005,995	104,710	1,713,987	225,227
Los Angeles	5,857,041	698,687	4,516,823	548,653
San Francisco	327,849	36,393	158,550	22,400
Ohio	46,787	4,869	278	62
Colorado	.....	.....	112,000	16,033
Totals	58,404,034	$6,398,828	83,355,447	$10,766,523

*Crude rubber including latex dry rubber content.

Foreign Trade Information

For further information concerning the inquiries listed below address United States Department of Commerce, Bureau of Foreign and Domestic Commerce, Room 734, Custom House, New York, N. Y.

No.	COMMODITY	CITY AND COUNTRY
*12	Latex, gutta percha, and rubber	Athens, Greece
†24	Crepe sole rubber, rubber tissues, rubber solution, and rubber goods	Istanbul, Turkey
†64	Belts and toy balloons	Singapore, Straits Settlements
*76	Wheels	Johannesburg, South Africa
‡78	Druggists' and surgical rubber goods	Cairo, Egypt
*9,969	Rubber goods and white rubber scrap	Brussels, Belgium
†9,987	Smoked crude and crepe rubber	Istanbul, Turkey
†9,992	Rubber goods	Sofia, Bulgaria

*Purchase. †Agency. ‡Purchase and agency.